

The Mining Journal

Established 1835

Vol. CCXXXVI No. 6028

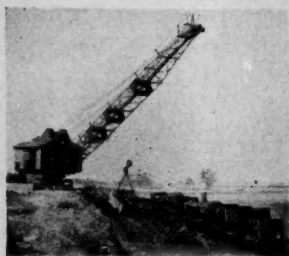
LONDON, MARCH 2, 1951

Railway & Commercial Gazette

PRICE 8d

RAPIER

Builders of Europe's
LARGEST EXCAVATORS



ALL SIZES FROM $\frac{1}{2}$ TO 11 CU. YD.

WALKING DRAGLINES

RANSOMES & RAPIER, LTD.
IPSWICH ENGLAND

T. BOYD BOYD & CO. LTD.

Passages by Sea & Air

11, Sise Lane, Queen Victoria St.,
London, E.C.4

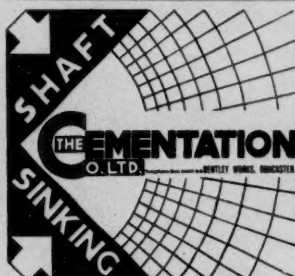
Telephone: CITY 4433 Telegrams: BOYELSA
also LIVERPOOL - GLASGOW - MANCHESTER - HULL

KNAPP & BATES LTD.

Flotation & Ore Dressing
Equipment

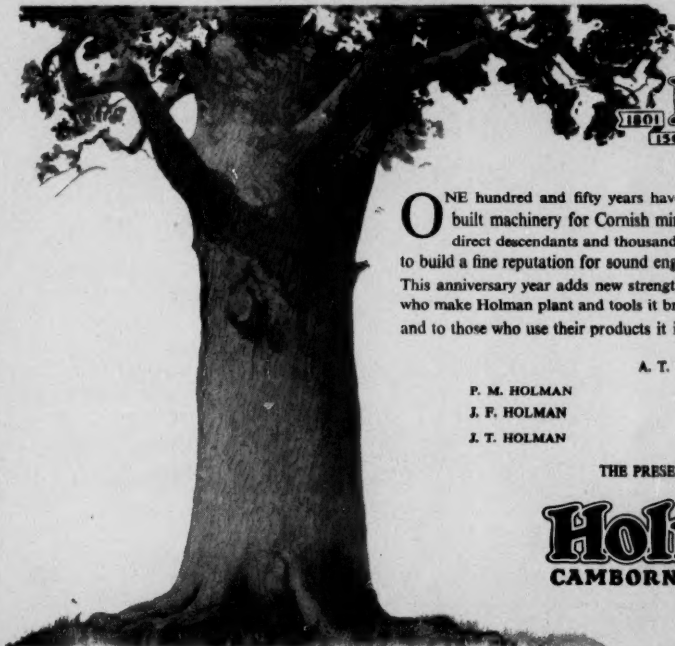
10, GATE ST., KINGSWAY,
LONDON, W.C.1

Cables: Flowchart Holborn, London Telephone: Chancery 6770



BL
Callender's
**FOR ALL
MINING
CABLES
AND
ACCESSORIES**

BRITISH INSULATED CALLENDER'S CABLES LIMITED
NORFOLK HOUSE, NORFOLK STREET, LONDON W.C.9.



H
1801 1951
150 YEARS

ONE hundred and fifty years have now passed since Nicholas Holman first built machinery for Cornish miners, years in which four generations of his direct descendants and thousands of Cornish men and women have worked to build a fine reputation for sound engineering—and a world-wide organisation. This anniversary year adds new strength to the long Holman tradition. To those who make Holman plant and tools it brings fresh confidence in future achievement, and to those who use their products it is an assurance of continued loyal service.

A. T. HOLMAN

F. M. HOLMAN

J. F. HOLMAN

J. T. HOLMAN

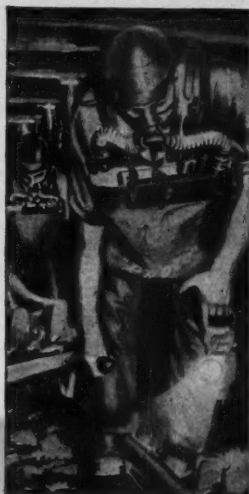
K. J. HOLMAN

J. K. J. HOLMAN

N. P. T. HOLMAN

THE PRESENT BOARD OF

BROS. LTD.
Holman
CAMBORNE, ENGLAND



BREATHING APPARATUS

of all British manufacture

by the Original Designers and largest manufacturers who have supplied Mines Rescue Brigades, the Fire Service, etc. for many years

"PROTO"
"LUNGOVOX"
"SALVUS"
"FIREOX"
Oxygen Types

also Compressed Air Apparatus

Smoke Helmets, Gas Masks, Dust Respirators, Resuscitation Apparatus for asphyxia, electric shock, etc. Protective Clothing, Goggles, etc., Diving Apparatus.

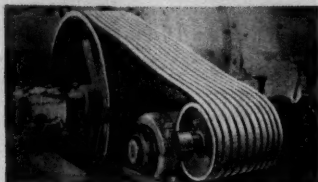
Established 1819

SIEBE, GORMAN & CO. LTD.
LONDON
EVERYTHING FOR SAFETY EVERYWHERE

TOLWORTH, SURBITON, SURREY

Telephone: Elmbridge 5900

Telegrams: Siebe Surbiton



For all types of
Mining Machinery
specify:—

WIGGLESWORTH
short centre V rope drives
"TEXROPES"

FRANK
WIGGLESWORTH
& CO. LTD
ENGINEERS
SHIPLEY YORKS

Phone: SHIPLEY 53141 Grams: CLUTCH, SHIPLEY



48, BURLINGTON ROAD, ISLEWORTH, MIDDLESEX

GENERATING SETS.

Two 31 K.V.A. Diesel driven sets with Cummins engines, direct coupled to alternators 400/230/3/50 with switchboards. Mounted on four pneumatic tyred road wheels with drawbar. One 31 K.V.A. as above but 230/1/60.

AIR COMPRESSORS.

Several Diesel driven sets by Consolidated type PO.2/125 with Ruston 3 VRO engines. Air receiver, fuel tank. On two wheel pneumatic trailer or four solid tyres.

PNEUMATIC TOOLS.

Several C.P.4. High lift sump pumps with delivery hose. Unused. Several Rock drills by Climax, 52 lbs. with 4 1/2 x 1 1/2 in. chuck. Unused. All sizes reconditioned road breakers, rock drills, woodborers, etc. Air hoses 3/4 in. in lengths 50/60ft. with or without couplings.

EXCAVATORS.

Ruston Bucyrus type 21 RB driven by Ruston 4 cyl. diesel engine and fitted with Forward Shovel equipment. Now being completely re-conditioned.

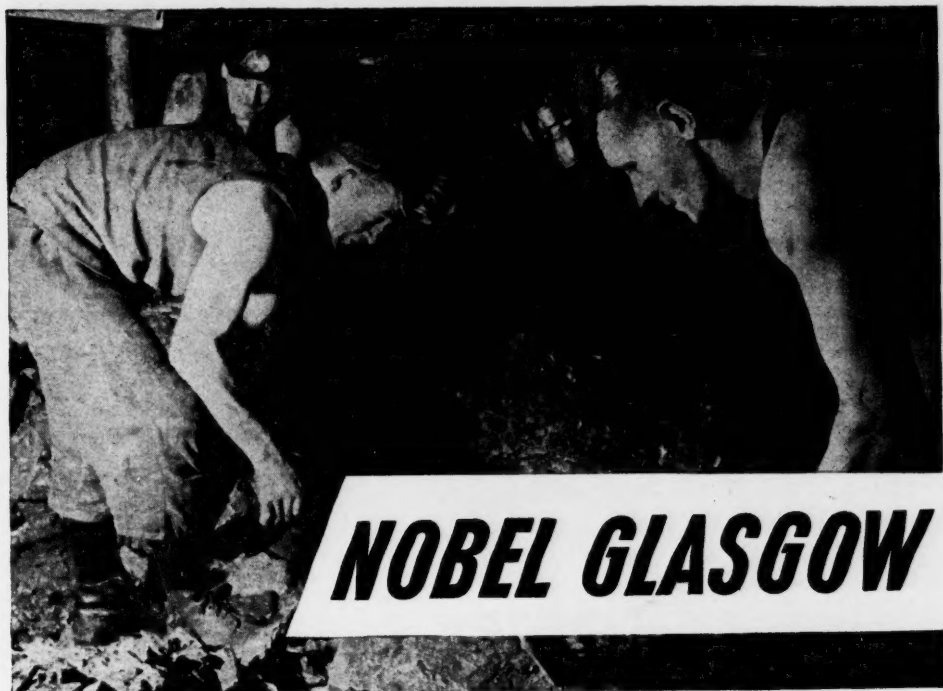
The Mining Journal 1951 ANNUAL REVIEW NUMBER

Summarizes events and statistics
of 1950

Will be Ready in May

- Orders for copies should be placed direct, or through Newsagents.
5s. 0d. post free.

Write: The Publisher, Mining Journal,
15 George Street, London, E.C.4.



NOBEL GLASGOW

EXPLOSIVES

FOR COALMINING

The assistance of our Technical Service Department is
readily available in connection with any problem
in Blasting, Ripping, or Drifting in coalmines.

Please address all enquiries to—

IMPERIAL CHEMICAL INDUSTRIES LIMITED

Nobel Division, 25 Bothwell Street, Glasgow, C.2



N. 578

IT'S *★ Preformed*
WIRE ROPE!



NO FLYING APART WHEN IT'S CUT



THE
BLUE STRAND
TELLS YOU IT'S
Preformed

★ Blue Strand Preformed means a big difference in handling and wear! The wires are Preformed into the exact helical position that they take in the finished rope, so that even when the rope is cut, there is no flying apart, the wires remain in place, relaxed instead of fighting internal stresses. No seizing required! Wires that do break after long wear—although visible—lie flat, meaning greater safety in handling. Because it's more flexible, Blue Strand Preformed has less tendency to kink. All over the world, Blue Strand Preformed Wire Rope is preferred . . . it lasts longer . . . gives better service!

BLUE STRAND

PREFORMED WIRE ROPE

A product of **BRITISH ROPES LIMITED · DONCASTER · ENGLAND**



EXPORT SALES OFFICE · 52 HIGH HOLBORN LONDON · W.C.1

The Mining Journal

Established 1835

Vol. CCXXXVI No. 6028

LONDON, MARCH 2, 1951

PRICE: 8d

EDITORIAL and ADVERTISING ENQUIRIES TO:

15 GEORGE STREET,
MANSION HOUSE
LONDON, E.C.4

Tel. Nos.: MANSION HOUSE 5511 & 9182

SUBSCRIPTION RATES: (Including Postage)

INLAND:	10s. ... 3 months.
	18s. ... 6 "
	32s. ... 12 "
ABROAD:	40s. ... 12 "

THIS WEEK'S FEATURES

WHAT IS RUSSIA'S INDUSTRIAL STRENGTH? - - -	Page 197
RECENT DEVELOPMENTS IN HEAVY- MEDIA PROCESS - -	Page 199

NOTES AND COMMENTS

International Commodity Committees

The announcement was made last week in Washington that the six projected International Commodity Committees to review supply, production and distribution of strategic materials had been set up: the first—the Copper-Zinc-Lead Committee to begin work on Monday last; followed by the Sulphur Committee on Thursday; the Tungsten-Molybdenum Committee on March 8 and the Manganese-Nickel-Cobalt Committee on March 12. Twelve countries have agreed to participate in the Copper-Zinc-Lead Committee, and presumably acceptances for the other committees will be similarly forthcoming. The necessity of such general co-operation among non-Communist States has been stressed in American administrative circles for some time past and the idea is understood to have taken definite shape after Mr. Attlee's visit to Washington.

During the last world war, warned by the huge rises experienced in certain metals during the first world war, price advances were, on the whole, fairly controlled and allocation committees among the Allies, coupled with all the restrictive arrangements possible in war-time operated fairly satisfactorily. The situation, however, last year was very different, as prices generally were already at a high level, working conditions in many countries were disturbed as the aftermath of a great war and the normal expansion of capital investment and development was largely put back by nearly a decade. Added to this was the general uncertainty regarding prices and general stability resulting from the wide currency devaluations initiated by the British Government in the autumn of 1949. The greatest single influence, however, was the long-term stockpiling policy initiated by the United States' Government and naturally imitated by big industrial consumers as well as by the governments of other countries at a later stage. From these conditions, thus very briefly indicated, it would seem to follow that what is chiefly needed in the world to-day is a vigorous and sustained policy for stimulating output of the strategic metals and minerals, to endeavour to gradually make good the increasing neglect which mineral development has suffered since the dark shadow of Hitler began to arrest normal commercial development. In the first instance such a policy would have to be governmentally inspired and sustained and we do not yet know whether, behind the committees now formed there is any prospect of financial subvention either by the United States' Government or any of the other interested powers. In any case, any such activities could hardly yield any short-term results and if they were to be adopted, would suggest that the present world scarcities were expected to

be long continued. We therefore cannot look with any great expectations for any unprecedented international attempt to develop mineral resources not at present available for industry.

Turning to the more immediate problems, the cessation of Government stockpiling, especially in the United States, offers the best hope of early alleviation of the many threatened bottlenecks. It seems generally believed that stockpiling of copper and zinc has been or will shortly be suspended and if so might be widely extended. It is in many cases almost impossible to say where defence requirements cease, since an enormous range of manufactured articles, not in themselves strategic, exists a substantial reduction of which would certainly hamper the mobilization of strategic resources. One of the most important objectives of the current enquiries must be to decide how far an artificially stimulated demand has outstripped actual necessity. Naturally, Service opinion—military, naval and air—will demand that their respective spheres should be placed in a position of security beyond all peradventure, but these requirements must be weighed against the sober conclusions of the Departments of State. Though it would be very hazardous to expect any reassuring developments to arise from projected negotiations with the Soviet, any *détente* in that quarter would minimize the difficulties to which world trade is now subjected. In normal times there is not a big margin between world production and consumption, and therefore stockpiling and the imposition of inordinate taxation and export duties have exercised a disproportionate effect on prices, especially in the case of countries whose revenues depend to a large extent on the price they receive for the exhaustion of their main capital resources.

It is impossible as yet to estimate how far various governments, which naturally desire to be represented in the conferences, may be prepared to go in what is to a substantial extent a self-denying ordinance. The success of the projected move must mean, in the long run, lower prices, and we have seen Chile, the second most important copper producer in the world, already making urgent representations for a higher price, if the national economy is not to suffer. However, the dominant financial and industrial supply position held by the United States to-day might prove decisive in overcoming reluctance of countries which depend upon the needs of the big industrial powers for their markets. The United States herself could give a lead in this respect by liberal allocations of that most essential mineral, sulphur, the consumption of which is often regarded as a barometer of industrial

potentiality. We might reasonably expect that committees would recommend ceiling prices for a large range of mineral and metal products which, if conscientiously observed should stop any further advance in world prices and, as has recently been seen in the case of tin, would probably not only stabilize prices but result in substantial reductions. However, we know so little of what decisions have been taken at the top level, or what the course of the enquiries may produce in the way of recommendations, that we can do little now beyond reporting that the committees have been set up and are coming rapidly into action—and await results.

What Price Tin?

A setback in tin price a fortnight ago leading to the cessation of the United States private purchases is a reminder that the fantastic price advances cannot go on for ever. Indeed, no-one in their cooler moments can expect this. The question which suggests itself is whether any reasonable plan can be devised looking to a more stabilized price level, and if so, what that price should be. Our contemporary, *The American Metal Market*, has suggested a ceiling of \$1.21 per lb., or 58 per cent above the average price for the first half of 1950, coupled with a selling price of \$1.25. To producers who may ask why this great reduction, our contemporary rejoins that the United States could very well do without any more tin for quite a number of years, and their experience when U.S. tin imports were embargoed in 1921 is sufficient reminder of what would doubtless occur again. Our contemporary puts the stocks of tin in the country at some 180,000 tons of metal and concentrates in process, and believes that essential uses of tin would not require more than 50,000 tons a year. But some tin would be available from abroad, which our contemporary suggests might be, at a minimum, 25,000 tons. With draughts of 25,000 tons a year, presently held reserves would last for seven years, or possibly longer, with the existing efforts being made to spread the savings on tinplate manufacture and solders. We are not concerned here to attempt to pass upon the suggested ceiling prices, which *The American Metal Market* has put up as a sort of sighting shot, but merely to point out that price advances have recently reached a figure which is obviously beyond what the United States, with all its wealth, is inclined to follow, and which is already tending to reduce consumption either by more economical uses, or by substitution. Without American buying these prices cannot be maintained, and once a fall started it might go far.

There is of course another angle to the picture. What would be the effect of a fall in tin prices from the present United States figure of 183c. per lb. to the suggested 121c. per lb.? How far would it result in a diminution of world production? In earlier years it was a commonplace in Malaya that when tin prices fell the Chinese worked harder, and produced more tin to compensate for the lower selling price, and so secure adequate supplies of rice. But fluctuations in tin prices of late have been out of all proportion with the changes experienced in pre-war days. Costs have greatly increased, the grade of ore is tending to fall, and we have no data to form a conclusion whether profits are at present exorbitant at any rate for the Chinese. Banka and Billiton have been on balance cheaper producers than Malaya. In Bolivia if we can trust government representations, the effect might be to disorganize the whole economy, and despite the rise in prices last year the production was approximately 3,000 tons lower. In the Congo the higher grade ores are said to have been largely exhausted, and in Nigeria the effect would probably be even more serious, with the result that the present excess of production which has made stockpiling possible would quickly disappear.

The European Coal Shortage

The latest statistics of world coal production give little promise of an appreciable improvement, if any, in European supply prospects during the coming months. When considering the outlook for the first quarter of 1951 the Coal Committee of the United Nations Economic Commission for Europe estimated the coal and coke import needs of the 18 countries represented at Geneva at 19,500,000 tons, and the deficit after taking into account the import availabilities of Belgium, Czechoslovakia, France-Saar, the Netherlands, Poland, the United Kingdom and Western Germany at approximately 5,000,000 tons of coal and 1,000,000 tons of coke. Since then the position has deteriorated. The output of hard coal in Great Britain in December was only 17,700,000 tonnes compared with 19,600,000 tons in November and with 18,600,000 in December, 1949; in Western Germany 9,600,000 tons compared with 10,000,000 tons and 9,200,000 tons respectively; and of the whole of Western Europe 36,600,000 tons as against 38,700,000 in November and 37,300,000 tons in December, 1949. This relatively severe slump in the British output, accompanied as it was by tightened restrictions on United Kingdom overseas shipments, immediately had, of course, unfavourable reactions on the Continental coal trade, practically depleting some countries of their stocks and compelling several to seek supplies from other sources as well as to curtail their normal industrial, transport, domestic and other forms of inland consumption.

The United States has been their chief refuge in this, as it was in the previous greater emergency, when in one year alone (1947) North American shipments to Europe reached a volume of some 37,000,000 tons. Nothing approaching such a tonnage of diverted trade is expected from the present crises. Two momentous changes since 1947 have been an increase in European hard coal production of over 100,000,000 tons and the virtual restoration during 1950 of European self-sufficiency in solid fuels. But last November the United Kingdom was committed by the Government to the possible acquisition of over 2,000,000 tons of U.S. coal; by February 5 last the National Coal Board had bought 1,073,000 tons from North America, India and Nigeria, and on the following day the Chancellor of the Exchequer stated that on its current programme the N.C.B. had by January 22 spent \$3,345,440 on purchases of coal from the States. Early this month, too, the German Coal Board and the Federal Government agreed to import 1,500,000 tons of American coal during 1951 at a cost of \$35,000,000; and under strong pressure it is reported, from the Federal German Government, the Industrial Authority for the Ruhr agreed to reduce Western Germany's export coal quota during the first three months of 1951 by 550,000 tons.

Among the worse effects of the disappointing trend of British supplies have been the reduction in reserves. The E.C.E. statistics for February show for Great Britain a decrease from 17,027,000 tons to 13,633,000 tons in the distributed stocks between October and December and from 2,819,000 tons to 2,293,000 tons at mines, collieries and patent fuel plants; from 1,724,000 to 1,071,000 tons in Belgium and from 333,000 to only nine tons to Holland. For France no reserves at mines or distributing centres are given later than October last, when they totalled 4,562,000 tons compared with 2,284,000 tons in the corresponding period in 1949.

For the March quarter the method of distribution of supplies to the needy countries has not been as hitherto by specific allocations, but by the terms of "Gentlemen's Agreement" reached among the exporters and importers establishing "a pattern" of supplies for individual importing countries. The quantity to be distributed is 10,500,000 tons of coal and more than 3,000,000 tons of coke.

What is Russia's Industrial Strength?

General speculation as to the extent to which Russian aggression will be advanced and what performance the Western world must achieve to counter it are matters of frequent speculation in which the general ignorance of Soviet affairs, economic and political, makes any confident conclusions difficult. Under the title of "What is Russia's Industrial Strength?" Mr. Dimitri B. Shimkin, of the Russian Research Center of Harvard University, recently contributed two articles to *Automotive Industries*, from which we have taken the following extracts. Mr. Shimkin, who was an officer on the Russian War Office Staff and then on the National War College of Washington, has in preparation a book entitled "Minerals—A Key to Soviet Power," the publication of which will be awaited with much interest by all those interested in the mineral industry.

In 1940, after 15 years of economic recovery and growth, the Soviet Union was the greatest industrial power in Europe except for Germany. Its population totalled nearly 200,000,000, including 34,000,000 men aged 20-44, its non-agricultural labour force was close to 30,000,000.

Soviet mobilization for the war with Germany had begun in 1937 and was well under way by 1940. Budgeted defence expenditures jumped from 17.5 to 56.1 billion roubles during this period. Munitions production more than tripled, while the expansion of basic industrial capacity virtually stopped. The armed forces grew to some 5,000,000 in strength. In June, 1940, the working week was lengthened from an average of 40.8 to 48 hours, with stringent disciplinary provisions. In October, 1940, mobilization of 14- to 17-year-old boys and girls for compulsory training and work in the factories and on the railways was inaugurated. Finally, the stockpiling of raw materials, such as nickel, molybdenum and rubber, as well as fuels and grain, was feverishly under way.

WAR ECONOMY

Immediately after the German attack on June 22, 1941, the Soviet Union shifted to a war economy. A small war cabinet or supreme defence council assumed unified political, economic and military control of the nation. The State Planning Commission shifted its functions from long-range planning to immediate operational control of the economy, especially the expediting of urgent war construction, and the rigid allocation of raw materials, transport and electrical power. The People's Commissariat for Medium Machine-Building was transformed into that for Mortar Armaments, while the one for Automotive Production supplied light tanks, artillery prime-movers, armoured cars and field artillery.

But initial Soviet plans proved to be insufficient. On August 16, 1941—the day of the German break-through in the Ukraine—a more radical "Military-Economic Plan for the IVth Quarter of 1941 and for 1942" had to be inaugurated. This plan was based upon maximum industrial evacuation to, and maximum munitions output in, the Volga Region, the Urals, Western Siberia, Kazakhstan and Central Asia. In the autumn and winter of 1941, 1,360 large plants—a quarter of them from Moscow and Leningrad—were evacuated eastward. German advances, by November, 1941, had deprived the Soviet Union of 63 per cent of its coal production, 58 per cent of its steel, 60 per cent of its aluminium, 38 per cent of its grain acreage and 41 per cent of its railroad mileage. In addition, 303 munitions plants with a monthly capacity of 11,100,000 artillery and mortar shells and 27,900 tonnes of explosives production were lost. Because of these events, Russia's industrial production declined by December, 1941, to less than half of its June, 1941, level, while output of such vital commodities as non-ferrous fabricates and ball-bearings virtually ceased.

To avert catastrophe, the Soviet Government took drastic measures. Civilian consumption was ruthlessly cut back. Virtually no gasoline or lubricants, for instance, were made available to civilian trucks and tractors, which had to run on firewood, lignite or peat, and use even turpentine for lubrication—or stop running. To win the war, the Soviet civilian had to eat less than any other belligerent. The nation's human resources were completely mobilized;

the percentage of women in the non-agricultural labour forces soared to 53 per cent in 1942, compared to 38 per cent in 1940. Lengthening of the working week to 66 hours, simplification of work processes, on-job training, incentive pay coupled with rigid stabilization of prices for the most essential commodities, and selective rationing helped compensate for the greatly lowered productivity of the mass of raw labour absorbed by the Soviet industrial machine. Materials were economized through substitutions, as of chrome for nickel steel in armour-piercing projectiles and by war-time reductions in standards, applied to manufactures ranging from electrical machinery to trucks and gasoline. Railway transport requirements were reduced by increased local supply, particularly through the victory gardens of factories and of the Army's rear services; by fuel stockpiling during the summer months; and especially by the concentration of military supply on selected lines with equipment, siding and storage capacity and personnel augmented to minimize turn-round time. Special organizations salvaged friendly and enemy equipment. Thus, the advancing Soviet troops were closely followed by ingenious rail-recovery trains, equipped to X-ray salvaged sections of units, cut off unusable parts, weld together the remainder and finally trim them to standard lengths—all on a belt line. Finally, the Red Army repeatedly, above all at Stalingrad, depended on anticipated and achieved capture of enemy stocks for a significant part of its supplies.

IMPORTANCE OF LEND-LEASE

Three factors beyond Soviet control greatly aided Russia's war effort. First, although the Germans greatly reduced the Soviet economic potential by the seizure of territories, and by frontal attrition, they made no systematic attempts to conduct strategic air bombardment, particularly of Russia's transport lines. Thus, the Soviet Union was able to execute its economic evacuation and redeployment and to supply its armies without harassment. Secondly, because its allies relieved it of the need for significant naval forces, or heavy bombardment aviation, the U.S.S.R. was able to concentrate on a limited range of ordnance production. Thirdly, Lend-Lease, including supplies from the United Kingdom and Canada, provided indispensable aid. The value of Lend-Lease never exceeded ten per cent of total Soviet industrial production, but in many critical areas of military supplies—copper, aluminium, signal equipment, trucks, etc.—it provided two-thirds and more. In fact, Lend-Lease provided 20 per cent of the total mineral consumption of the U.S.S.R. in 1944. In other instances, Lend-Lease established new industries, particularly the production of aviation gasoline. It also relieved sudden emergencies, such as the crisis in Soviet food supply after the German occupation of the North Caucasus in 1942. Towards the end of the war, the Soviets used Lend-Lease not only as a means of covering war-time requirements, but also to rebuild great stockpiles of nickel, molybdenum, truck tyres and other strategic reserves. Finally, the value of the industrial knowledge gained by the thousands of Soviet technicians in the United States alone is incalculable.

Together, all the factors mentioned permitted the Soviet Union to maintain and develop a major military effort. It trained, deployed and supplied an average of some 13,000,000 men and women in its armed forces. In 1944,

Soviet munition output amounted to 35-40 per cent of the American. It approached equality in certain weapons. During the last three years of the war, the annual Russian output of tanks and self-propelled artillery averaged 30,000; of aircraft, primarily fighters and ground attack aviation, 40,000; of artillery of 20 mm. and higher, 120,000.

Furthermore, ordnance design was by no means static. It is true, of course, that some slightly modified weapons of World War I vintage, especially the Maxim type machine-gun and several heavy artillery models, continued in use. But the bulk of Soviet ordnance consisted of designs developed between 1938 and 1940. Characteristic also was the progressive modification of these models to maximize their effectiveness. Thus, the KV heavy tank,

seriously weakened. True, some industries had risen above pre-war levels and coal had recovered to some 105,000,000 tonnes, plus 45,000,000 tonnes of lignite. Post-war territorial acquisitions covered other losses, such as those of population. But still other wounds were not easily healed. Railway rolling stock totalled half of pre-war numbers; steel output in 1945 was but 60 per cent that of 1940. Possibly a quarter of the entire national wealth of the U.S.S.R. had been destroyed. Rehabilitation would require an enormous effort.

Less than a year after the end of the war, in March, 1946, the Soviet Union proclaimed a new Five-Year Plan of economic reconstruction and expansion. First priority was allocated to heavy industry and transport.

COMPARISONS IN PRODUCTION: U.S.S.R. AND EUROPEAN SATELLITES—U.S.A., U.K. AND CANADA

Unit	U.S.S.R.		Satellites (1948)	Total (1949)	U.S. 1948	U.K. 1948	Canada	
	1940	1949					1948	1948
Population .....(millions)	198.0	(200.0)	88.4	289.0	144.0	49.5	13.0	206.5
Coal .....(million tonnes)	142.5	(200.0)	89.5	(290.0)	590.6	210.8	15.3	816.7
Lignite ¹ .....(million tonnes)	23.5	(50.0)	41.8	(91.8)	2.4	—	1.4	3.8
Petroleum (crude) ² .....(million tonnes)	31.0	34.2	4.5	38.7	276.2	—	1.5	278.7
Electric Power .....(billion kWh.)	48.3	(68.0)	(30.0)	(98.0)	336.6	44.0	44.6	425.2
Steel Ingots .....(million tonnes)	18.3	23.6	4.8	28.4	80.3	15.1	2.9	118.3
Copper (primary) .....(thousand tonnes)	(110.0)	194.0	31.0	225.0	839.6	74.3	192.9	1,106.8
Aluminium (primary) .....(thousand tonnes)	56.7	99.0	5.1	150.0	565.0	30.5	372.5	968.0

Notes: Figures in parentheses are approximate.

¹ Lignite at one-third of its physical weight.

² Including petroleum equivalent of natural gas.

first put in production in 1940, increased its armament during the course of the war from the 76 mm. to the 85 mm. and, finally, to the 122 mm. gun; with the assault-gun superstructure, to the 152 mm. gun-howitzer. Greater thicknesses of armour increased its weight from 40 to 60 tons. Yet the engine, transmission and tracks remained unchanged. Mention must be made of the new weapons introduced by the Red Army towards the close of the war, such as the 160 mm. mortar and the 100 mm. anti-tank gun. But it is also essential to remember that the Soviet Union produced no radically advanced weapons such as the German magnetic mine and V-1 and V-2 missiles, or the Anglo-American radar bombsight, proximity fuse or atomic bomb.

EXPANSION OF MANUFACTURING INDUSTRIES IN EASTERN RUSSIA

In other economic areas Soviet achievements were more uneven. The civilian population suffered great hardships, but comprehensive public health measures and iron control of food supplies prevented epidemics like the typhus and influenza outbreaks of World War I, or famines like the disaster of 1921. Again, despite the extreme requirements of munitions output, the expansion of basic production capacity continued throughout the war, ameliorating war losses and reducing bottlenecks. Coal and lignite production in the unoccupied regions were expanded by more than 40,000,000 tonnes. Manufacturing in the east increased sharply, so that the Urals alone were able to produce 40 per cent of Russia's total ordnance. The output of aluminium, copper, lead, magnesium, nickel, tin, tungsten and vanadium rose far above pre-war levels. Several important railway lines were constructed especially to improve communications between Central Russia and the Caucasus and between Central Russia and the new coal mines at Arctic Vorkuta. Yet retrogression also took place in the deep rear. Excessive pumping and lack of drilling cut petroleum output by more than one-third. In addition, lack of maintenance reduced railway capacity everywhere.

All in all, the Soviet Union emerged from World War II

What have been the achievements of the Fourth Five-Year Plan to date? According to official Soviet statistics, published on January 18, 1950, industrial production, after a rise of 20 per cent in 1949 over 1948, had exceeded the 1940 level by 41 per cent, a rate of progress in excess of the Plan. Claimed productive increases for the period 1945 through 1949 have, however, been very different in differing parts of the national economy. The patterning of these dissimilar increases is instructive: least change has been claimed in the size of the non-agricultural labour force, a rise of 32 per cent since 1945, and 15 per cent greater than in 1940. Between 1945 and 1949, electrical power output is said to have risen by 74 per cent, while freight car loadings increased by 43 per cent between 1945 and 1948. Next in scale have been the alleged increases in mineral production—copper, coal, petroleum, pig iron, lead and zinc—which ranged upward by an average of some 75 per cent from 1945 to 1949. Over the same period, grain output is said almost to have doubled. Even higher are the claims for construction materials.

Two questions arise from these claims: Are they true? If so, how have the Soviets been able to achieve them?

INCREASING INDUSTRIAL OUTPUT

It is my belief that the Soviet figures for increases in industrial production are inflated, as shown by the great disproportion between claimed advances in manufacturing as opposed to raw materials consumption, as independently estimated. Nevertheless, it is clear that the country's industrial output in 1949 has actually exceeded the 1940 level by a substantial margin. Thus, mineral consumption in 1949 appears to have been almost 30 per cent higher than in 1940. Man hour input by the total non-agricultural labour force (excluding members of the armed services) has increased by 27 per cent as a result of increases both in numbers and in working hours. For industry (munitions excluded) the corresponding increase is at least 30 per cent.

Estimates of changes in Soviet output for selected items are given in the table above. In general, these figures

show important increases. Agricultural production, it is true, is still on the 1940 level or lower. Furthermore, consumers' goods, on which even conjectural statistics are lacking, seem in large part to have remained below pre-war outputs. Finally, it must be stressed that productive capacities have not kept in step with output. Thus, blast and open hearth furnace capacities in 1949 did not exceed those of 1937-40; locomotives and freight cars aggregate not more than two-thirds the 1940 numbers, although freight ton mileage has recovered to the earlier level.

The mechanisms of Soviet recovery are generally explicable. Six factors appear to have been important. First was the quantitative and, above all, qualitative improvement of the labour force resulting from the demobilization of the armed forces, coupled with long working hours and rigorous labour controls. In addition, continued high employment of women, who formed 50 per cent of the non-agricultural labour force in 1949, and the use of imported free and forced workers to an unknown degree, have enabled Russia to conscript its younger manpower into the armed services. Second, the Soviet Union has used its productive capacity at the highest level possible, especially so in 1949. The third factor has been substantial reconversion of a machine-tool stock which was relatively lightly damaged during the war and which was then augmented, certainly above pre-war levels, by Lend-Lease, war booty and reparations. The fourth has been the increased availability of many materials through war-time and post-war expansion of output; through territorial acquisitions; and through imports from the satellite regions in Europe and Asia.

EFFORT CONCENTRATED ON WESTERN RUSSIA

For nine minerals, supplies available from these areas exceed Soviet domestic production. These minerals include antimony, barite, bismuth, bromine, cadmium, fluor spar, potash, talc and tungsten. Significant amounts of bauxite, beryllium, coal and lignite, cobalt, copper, gold, graphite, lead, magnesite, magnesium, chloride, mercury, molybdenum, petroleum, phlogopite mica, salt, uranium and zinc are also procurable from these peripheral territories. Finally, the sixth factor appears to have been a shift in the Fourth Five-Year Plan from a balance between reconstruction in the West and new investment in the East, to a concentration of effort largely on the West. Thus, while the planned construction of railways, steel mills and other industrial establishments, e.g., the Novosibirsk Automobile Plant in the East seems to be lagging, a number of new as

well as reconstructed plants are in operation in the Ukraine and White Russia. In fact, most of Soviet recovery in 1948 can be ascribed to the revival of the Ukraine. Thus, the balance of Soviet industrial output is again shifting westward, a phenomenon of obvious political and military significance.

CONCLUSIONS AND COMPARISONS

Russia's large population and substantial mineral wealth are corner-stones for major economic expansion in the future. On the other hand, limited agricultural resources and an inadequate transport network are foreseeable bottlenecks. Although ample evidence of Soviet inventiveness exists, the nation's technological policy to date has been one of selective imitation of the West. Technological inadequacies, such as high waste and difficulties in model change, are manifest, but Russian technology is generally maturing at a rapid rate. Economic management in the Soviet Union is vigorous and purposeful, and especially characterized by the ability to mobilize the utmost of the country's human and material reserves for its purposes. The possibility of gross misdirection of effort is, however, always present in a dictatorial state.

In 1940, Russia's production was exceeded only by the United States and Germany. Its national income was possibly 40 per cent as great as the American, although its output of durable goods probably did not exceed one-fourth of that of the U.S. During World War II, extraordinary Soviet efforts, aided especially by Lend-Lease, made possible a major war effort despite enormous losses of life and national wealth at German hands. Since the war, Russia has continued a tremendous campaign of production. By 1949, it had considerably surpassed its pre-war levels of output, except in agriculture. But increases in productive capacity have lagged.

In comparison with the United States, Soviet production to-day is no greater relatively than in late pre-war years, because American production has also risen. Output *per capita* is still very low by the standards of the West. The satellite states are particularly impoverished. Thus, barring the recurrence of a great depression, the West is not confronted by a major challenge in peaceful production. But the memory of highly creditable Soviet war production between 1941 and 1945, coupled with post-war economic growth, and with Soviet capabilities of seizing the productive plants of continental Western Europe, forbids complacency towards the potential military challenge of Russia's economy.

Operating Factors & Recent Developments in Heavy-Media Process*

By L. J. ERCK (Chief Metallurgist, Cleveland-Cliffs Iron Co.)

Although it has been possible to follow the development of the heavy-media process in general and watch it grow throughout the United States and finally all parts of the world, the author has had to confine his efforts to its further development as applied to iron ore. By the same token, there now exist hundreds of experts in this field, which is a far cry from the early days when the work was first started and there was no particular reference to turn to. For this reason, the author will by necessity have to confine his remarks to the more recent advancements that have been made in the concentration of iron ores as applied primarily to the Mesaba Range.

Glancing backwards, Butler Brothers were originally interested in the scheme of heavy-media during the winter

of 1936-37. This being based upon the apparent success of the operation at Mascot, Tennessee, in which galena was employed as a media. The process at this time was commonly called the "Differential Density Heavy-Media Process," utilizing a definitely established differential in gravity in the cone separator. The amenability of the scheme was tried out at the Mines Experiment Station at the University of Minnesota and found to be applicable, as determined by a series of tests. From this, then, a plant was designed which was constructed at Trommald, Minnesota, for concentration of manganiferous ores. Construction of this plant was completed during the summer of 1937

* Abstract from a paper presented at the 1950 American Mining Congress Meeting, Salt Lake City.

and an effort made to operate the same. Unfortunately, the operation was very distant from the original source of galena, which eventually proved to be the determining factor in discontinuing the effort; however, the experience gained paid off many times over as the idea of heavy-media separation was accepted and a trail was marked for determining more suitable solids to be used.

DEVELOPMENT OF THE PROCESS

This actually was worked out at the Mines Experiment Station, University of Minnesota, under the direction of Mr. H. H. Wade, at which time 15 per cent ferro-silicon was suggested. This media has a maximum resistance to oxidation and maximum magnetic susceptibility. Ferro-silicon pig of this composition, ground to 65 mesh and mixed with water to the extent of 80 per cent solids, produced a very desirable media. From this point on the technology of the process was developed, growing from the original 6 in. cone employed for the first tests, through the 3 in. cone used for pilot work at the Experiment Station, thence to a 4 in. cone operated on the Mesaba Range on a 24-hour basis, and finally to the first commercial unit, constructed at the Harrison Plant at Cooley, Minnesota.

Present Status.—It is interesting to follow the progress that has been made from the early days of the 6 in. cone through to the many installations which are now operating or are being anticipated. The table below contains a recent list of all the heavy-media plants in operation or under construction at the present time and has been supplied through the courtesy of *American Cyanamid Company*, which has been responsible for conducting the original test work in many of the instances of the noted companies given in the table. Many machinery manufacturers were quick to recognize the extreme possibilities being presented, and their co-operation and guidance assisted in furthering the rapid advance of this process.

The first effort was to concentrate lead-zinc ores at the American Zinc Company's plant at Mascot, Tennessee. From here the effort extended to the plant in the Cuyuna Range, attempting to establish a continuous operation for concentrating manganiferous ores. From here, the process has extended to other parts of the world, separating materials from the lowly concrete aggregate, to the recovery of diamonds in the Transvaal. This is undoubtedly one example of the extreme sensitivity of the process. The plant of the Premier Diamond Mines, Transvaal, has in the pilot stage treated 550,822 loads. Of this, 507,793 loads were of mine ground from which an average yield of 24.37 carats per 100 loads were realized. The remaining 43,029 loads were from old dump tailings, from which an average recovery of 12.33 carats per 100 loads was made. It must likewise be remembered that all of the plants listed do not use ferro-silicon as a media, but in some cases, particularly those on coal, are using magnetite in varying degrees of fineness, depending upon the specific gravity employed as well as the fluidity of the media.

Development of Equipment.—The first flow-sheet used was patterned mainly after the original used at Mascot, Tennessee. This was more or less used as a starting point inasmuch as there was no other practice which could be followed at that time. It was quite apparent, after going through the initial stages of this problem, that concentration of manganiferous ores was entirely different from that of lead-zinc, in that recoveries of 75 per cent and higher were realized. Even a combination of the best imaginations at that time could not develop anything more practical than

the 70° cone being used and the internal air lift and all its inherent difficulties.

The first development done in the way of separators was towards what is known as the closed top cone; this, for want of a better tool, served its purpose during the early years and to this day can still be considered an efficient piece of equipment as far as the heavy-media process is concerned, providing that the percentage of tailings, or float material, does not exceed 40 per cent of the weight. At this point, the excessive amount of tailing interferes with the operation, resulting in tramp float in the sink product.

Colorado Iron Works Company recognized the necessity of a more efficient separator, one which would have a positive removal of sink product irrespective of the ratio of concentration, and one which would eliminate the use of an air lift, and the high horsepower input required for producing the air necessary for removal of the sink. The work carried on at the Harrison Plant finally resulted in the first commercial installation of the Akins Heavy-Media Separator at the Patrick Plant, at Cooley. It was not long however, before the field again became active in further developing the heavy-media separators, which in principle paralleled that of the Akins. The first of these was the Hardinge Counter-Current Heavy-Media Separator, first tried at the Hill-Trumbull plant. This effort was closely followed by the drum, as prosed by Western Machinery Company, now being operated at two plants, one in Minnesota and one in Michigan. Two other drums have likewise been developed in more recent years, namely by the Link-Belt Company and the Nelson L. Davis Company, which are being used on coal separation with magnetite as a media.

This same advance has also been made in auxiliary equipment, such as screens and pumps. Considerable progress has also been made in screen cloths for minimizing blinding and, at the same time, increasing cloth life.

THE ROLE OF MAGNETIC SEPARATORS

The next most spectacular advance made in equipment used in the heavy-media process is that of the magnetic separators. Up to several years ago, one type of magnetic separator was used exclusively for the recovery of the magnetic ferro-silicon as well as magnetite. The company manufacturing these separators, however, was not satisfied to rest on its laurels, but continued to study the problem and, during this interim period, changed the design twice. The most recent change in design has simplified the separator considerably, making it much easier to install in the plant and, according to early indications, is much more efficient in recovering ferro-silicon. This, however, has not prevented competition from moving in and attempting to find favour in the eyes of the operators.

The densifier likewise has also played an important part in the flow-sheet of the heavy-media process and represents a development that took place during the early stages when trouble was being encountered in getting the high specific gravity solids in and out of the thickeners. It was originally a conventional type Akins Classifier. The series of changes immediately indicated that, by causing the particles to flow in the same direction as the rotation of the spiral, extremely fine separations could be made, particularly when the media was magnetized. The last two years have seen this field invaded by competitive equipment in which the Hardinge Counter Current Classifier has been employed successfully as a dewatering device for preparing the feed to the magnetic separators. The most recent development in magnetic separators, however, if proven successful, could mean elimination of the densifier from the flow-sheet. Such a flow-sheet is now being practised

at The Cleveland-Cliffs Iron Company's Canisteo Plant, Coleraine, Minnesota. This plant has definitely eliminated the wash water densifier, and although full-scale operation has not yet been attained, this flow-sheet clearly indicates that this procedure is feasible.

Fine Ore Separation.—It was thought for some time that the lower practical limit of screen sizing treated by the heavy-media process was around $\frac{1}{16}$ in. This was particularly true in the design of the closed top cone when high velocities were used on the media for elimination of the middling and tailing. It was suitably demonstrated at that time that the lower limit to be treated was $\frac{1}{16}$ in. With the advent of the Akins Separator, this limit was dropped to $\frac{1}{32}$ in. without any difficulty. There were always indications that it was possible to go lower in size, but it was never understood how it could be accomplished mechanically. Butler Brothers developed a drag separator during the winter of 1939-1940, which was used primarily for testing the feasibility of separating ores below $\frac{1}{32}$ in. by the heavy-media process. It was found at that time that very clear separations could be made down to 28-mesh with acceptable separations to 48-mesh. Below this, separations were either obscure or the recovery of the fine sink was not enough to justify the effort.

POSSIBILITIES OF THE DUTCH STATE CYCLONE

This investigation might have continued had it not been for the mechanical difficulties encountered in the drag separator. With the advent of the Akins Separator the problem was again taken up and an effort made to use the Akins as a separatory vessel for making the fine ore separations. Work on the Akins Separator has now been discontinued. At this same time the American Cyanamid Company was investigating the possibility of the Dutch State Cyclone using magnetite as a media and treating ores from $\frac{1}{16}$ in. on down. A pilot unit has been installed recently on the Mesaba Range and ores of all types and varieties are being treated in this plant to establish the operating limits. So far, results are extremely encouraging and indicate that there is every possibility of advancing this process to commercial proportions. Parallel to this, investigations have been carried out using a new type heavy-media separator on $\frac{1}{16}$ in. material which has been classified at 60-mesh, thereby making the feed $\frac{1}{16}$ in. 60-mesh. The Cyclone to date has been using magnetite as a media, and the new type, ferrous-silicon. It would appear that the new separator has possibilities as a fine ore separator. Operators interested in heavy-media separation are watching this with keen interest, for it definitely introduces the missing link in concentration of ores where heavy-media has up to now proven so efficient in sizes down to $\frac{1}{16}$ in. and in one instance somewhat finer. It would appear now, in light of the most recent developments, that heavy-media will again come forth and assume still more responsibility as far as concentrating low grade horizons is concerned.

Three-Way Separations.—It has long been realized that it would be highly advantageous to make a three-way separation, particularly in one vessel. The author has long challenged this thought and is reluctant to admit that it is possible to make three clear-cut products from one separator, primarily a concentrate, middling and tailing, unless very close sizing is practised. Ways and means may, however, be determined for increasing the efficiency of a possible three-way separation to a point where it would be attractive, particularly if the metallurgical problem so dictates. Such a case has been advanced on one property, that of the Barton Mines Corporation, North Crete, New York. In this installation, a 54 in. Akins Separator replaced an open top cone having an external air lift. The Akins Separator was so designed as to make a middling product

as well as the sink and float products. Here is a specific instance in which a three-way separation plays a very important part in milling and assisted in solving a very difficult metallurgical problem. The middlings were screened with the coarser fraction being reduced in size and returned to the original feed to the Akins Separator. Thus, it was possible to increase the efficiency of the plant and made possible treating a horizon which could not be handled with the original cone.

General Application to all Minerals.—It can be generally concluded, as stated above, that the art of heavy-media separation has advanced from the early days of the initial effort of separating zinc-lead ores and manganese ores to the present status. Basically, the flow-sheet has not changed, in that it still requires a heavy-media separator, followed by adequate screening and recovery equipment for maintaining a low degree of media loss as well as retaining a fluid media for efficient separations.

The following list of operations employing the heavy-media process, shows the effectiveness of this process. It has long been realized that the process is very elastic and will satisfy virtually all ratios of concentration, which again is clearly indicated by the variations of the separation of diamonds from the gangue, through the more moderate recoveries as obtained in zinc-lead operations, to the extremely heavy recoveries made on iron ores.

Cost Factors.—The general question presented by those who are considering the heavy-media process for their problems, is how much will the cost be per ton? This question takes in many variables and it is somewhat difficult to give a firm, yet general, answer which will satisfy all conditions. Factors that have to be considered include geographic location; type of media to be used; amenability to the heavy-media process; ratio of concentration; general economics and whether or not the process is to be used for final concentration or as a scalping process for primary elimination of tailing material. In order to obtain an idea as to how one would proceed in obtaining the desired information, a hypothetical case might be considered which would include all the steps necessary for proper examination of the problem. First of these would require a study of the present situation. In most cases this involves a property which has either approached extreme ratios of concentrations, thereby involving high crushing and grinding costs, or properties in which gravity separation, such as jigging will no longer satisfy the present means of beneficiation. In either case, an adjustment has to be made if the property is to continue operation. Fortunately, in both cases, there are usually enough exposures available from which representative samples might be taken.

In order to obtain a fair and unbiased answer, representative samples have to be taken. These, then, would be subjected to a series of tests such as have been developed by experience, which will predict whether or not heavy-media will suitably afford the desired separation. A study of these preliminary results will determine whether or not additional work is justified.

PILOT PLANT TEST WORK

The second phase then would be pilot plant test work. These tests are usually conducted on relatively large samples and in the final analysis are generally conclusive enough to establish whether or not commercial application should be considered. The American Cyanamid Company is equipped to conduct such tests. On the conclusion of their work, it will present a comprehensive report with their firm recommendation.

Once figures have been accumulated and studied, then the operator can determine whether or not the application of the heavy-media process will reduce operating costs. In

most cases it has definitely been proven that once heavy-media has been applied, the horizons heretofore considered non-concentratable can be treated at a profit. This has been proven time and again as properties which have been idle for years are again operated once heavy-media was made part of the flow-sheet.

FACTORS OF SUCCESS

Factors which contribute to the success of heavy-media are: (1) concentration of ores in which the gravity separation of the ore and gangue is too close for hydraulic means; (2) heavy-media separation produces higher recoveries due to closer selectivity based on apparent specific gravity; (3) the heavy-media process makes it possible to handle larger tonnages; and (4) rapidity of separation by the heavy-media process means more tons of concentrates per manhour worked.

In the final analysis, the operator will have to balance against the cost of labour, power and material. If the tonnage is not increased to the plant by adopting the heavy-media process, then the only possible gain can be that of additional recovery due to the high degree of selectivity. In this case, it is doubtful whether or not the process would pay its way. In virtually all instances, however, the recovery is not only increased but also the feed rate, which means more tons of feed as well as concentrates per man-hour worked.

Heavy-Media Separator Plants in Operation

Name	Plant Location	Vessel
COAL-BITUMINOUS		
Pittsburgh Coal Co.	McDonald, Pa.	Link-Belt
H. C. Frick Coke Co.	Greensboro, Pa.	1-20' Cone
Clean Eagle Coal Co.	Huffsville, W. Va.	7' Mobil-Mill
Central Sand & Gravel Co.	Eckhart, Md.	7' Mobil-Mill
Penna. Coal & Coke Corp.	Winburne, Pa.	10' ConeWKE
C. E. Campbell Coal Co.	Treveskyn, Pa.	7' Mobil-Mill
R.P.M. Inc., Joliana Mine	Dequoin, Ill.	7' Mobil-Mill
Nugent Mining Co. Rattle-	Lane Mills, Pa.	7' Mobil-Mill
snake Mine	Gary, W. Va.	Akins
U.S. Coal & Coke Co.	Belgium	7' Mobil-Mill
Hensies	Galloway, W. Va.	10' Mobil-Mill
Simpson Creek Collieries	Dehue, W. Va.	Davis
Youngstown Mines Corp.	Riddlesburg, Pa.	7' Mobil-Mill
Riddlesburg Mining Co.	Marissa, Ill.	10' Mobil-Mill
Mid-Continent Coal Co.	Belleville, Ill.	7' Mobil-Mill
Belle Valley Coal Co.	Brownsville, Pa.	8 Link-Belt
Jones - Laughlin's Vesta	.....	6 Davis
Plant	Dovai, France	Davis
Houilleres du Nord	Anchorage, Alaska ..	7' Mobil-Mill
Evan Jones Coal Co.	Sarre, France	Davis
Regie des Mines de la	Amonate, Va.	2 Link-Belt
Sarre	Monterey, Tenn.	7' Mobil-Mill
Pocahontas Corp. ....	.....	.....
Central Coal Co. ....	.....	.....
COAL-ANTHRACITE		
Thoades Contracting Co.	Mahonoy City, Pa.	Link-Belt
Gilberton Coal Co.	Girardville, Pa.	10' Mobil-Mill
SPODUMENE		
Lithium Corp. of America	Rapid City, S.D.	5' Mobil-Mill
IRON ORES		
Butler Bros. Patrick Plant	Cooley, Minn.	2-78" Akins
Butler Bros. Harrison	.....	.....
Plant	Cooley, Minn.	Hardinge
Mesaba-Cliffs Mining Co.	Calumet, Minn.	Hardinge
Mesaba-Cliffs Mining Co.	Taconite, Minn.	2-78" Akins
Rhude & Fryberger	Ironton, Minn.	10' Mobil-Mill
Pacific Isle Mining Co.	St. Louis City, Minn.	Hardinge
Stanley Mining Co.	Biwabik City, Minn.	68" Akins
Sloss-Sheffield Steel & Iron	Franklin City, Ala.	10' ConeWKE
Algoma Ore Properties	Soo, Canada	12' Cone
Hanna Ore Mng. Co.	.....	6' Cone
(Buckeye Mine)	Coleraine, Minn.	Akins
Lone Star Steel Co.	Daingerfield, Tex.	7 1/2" Cone
Inter - State Iron Co.	.....	.....
(Grant Mine)	Buhl, Minn.	10' Mobil-Mill

Name	Plant Location	Vessel
Hanna Coal & Ore Corp.	Crosby, Minn.	Wemco Drum
(Maroco Mine)	Ironwood, Mich.	7' Mobil-Mill
Zontelli Bros.	Russellville, Ala.	10' Mobil-Mill
Shook & Fletcher Sup. Co.	Ludvika, Sweden ...	7' Cone Wem-
Stripa Gruvaktiebolag ...	.....	co Design

ZINC AND ZINC-LEAD ORES

American Zinc Co.	Mascot, Tenn.	1-10" Cone
Eagle-Picher	Cardin, Okla.	1-19" Cone
Kootenay Belle (Retal-	.....	.....
lack Mines)	Kaslo, B.C.	10' Mobil-Mill

FLUORSPAR ORES

Rosiclare Lead & Fluor-	Rosiclare, Ill.	14' Cone
spar Co.	Rosiclare, Ill.	10' Cone
Alcoa Mining Co.	Marion, Kentucky ...	5' Mobil-Mill
Inland Steel Co.	Marion, Kentucky ...	5' Mobil-Mill
Kentucky Fluorspar Co.	Elizabethtown, Ill. ...	7' Mobil-Mill
Crystal Fluorspar Co. ....	.....	.....

LEAD ORE

Linton Mines	Bonita, Montana ...	7' Mobil-Mill
--------------------	---------------------	---------------

TIN ORES

Compania de Colquiri.	Colquiri, Bolivia ...	6' Cone
Cerro de Potosi	Potosi, Bolivia	9' Cone
Patino Mines & Enter-	Catavia, Bolivia.	1-10' Cone
prises .....	.....	.....

CHROMITE ORE

Benguet Consolidated	Philippine Is.	Sweco
Mining Co. ....	.....	.....

ANDALUSITE

Vereeniging Brick & Tile	Vereeniging, S.A. ...	5' Cone
Co. ....	.....	.....

MAGNESITE

Northwest Magnesite Co.	Chewelah, Wash. ...	20' Cone
Canadian Refractories ...	Kilmar, Quebec	14' Cone

GARNET

Barton Mines Corp.	North Creek, N.Y.	54" Akins
-------------------------	------------------------	-----------

DIAMONDS

Premier (Transvaal) Dia-	Cullinan, S.A.	4-16' Cones
mond Mines	Kimberley, S.A.	5' Cone
Anglo American Corp. ....	.....	.....

GRAVEL

Royal Canadian Air Force	Rivers, Manitoba ...	7' Mobil-Mill
--------------------------	----------------------	---------------

Heavy-Media Separator Plants under Construction

Name	Plant Location	Vessel
BITUMINOUS COAL		
Pocahontas Corp.	Itman, W. Va.	3 Link-Belt
Pickands Mather & Co.	Mather, Pa.	Link-Belt
Powell Coal Co.	Kittanning, Pa.	7' Mobil-Mill
Hallidayboro Coal Co.	Elkville, Ill.	7' Mobil-Mill
Lone Star Coal Co.	Brazil, Ind.	7' Mobil-Mill
Hensies	Belgium	Wemco
W. O. Gulbranson, Inc.	Houtzdale, Pa.	10' Cone
Crystal Block Coal Co. ...	Rawl, W. Va.	Sweco
IRON ORE		
Inter-State Iron	Calumet, Minn.	(WKE)
Cleveland-Cliffs Iron	Minn.	Hardinge
Georgia-Alabama Ore Co.	Bluffton, Ala.	7' Mobil-Mill
DIAMONDS		
Williamson Diamonds ...	Tanganyika	7' Cone
Consol. Diamond Mines ...	South-west Africa ...	12' Cone
Foriniere Forestiere et	.....	.....
Miniere (Congo)	Belgian Congo	7' Mobil-Mill
LEAD-ZINC		
Mesloula	Algeria, N. Africa ...	7' Mobil-Mill
LEAD ORE		
Zellidja	French Morocco.	18' Cone
MAGNESITE		
General Refractories Co.	Radenthein, Austria	14' Cone
.....	(Wemco)	.....
FLUORSPAR		
Newfoundland Fluorspar	St. Lawrence, Newf.	7' Mobil-Mill

REVIEWS

Statistical Summary of the Mineral Industry.—*Production, Imports and Exports (1942-1948).* 1950, London: H.M.S.O., Royal 8vo. Pp. iv + 341. Price £1 5s. 6d., post free.

The latest edition of the Statistical Summary of the Mineral Industry, described by the U.S. Bureau of Mines as "representing an outstanding contribution that is not paralleled by any similar publication of other foreign government agencies," has just made its welcome appearance. It continues, under a slightly different title, the series of statistical summaries hitherto published for the Imperial Institute under the title "The Mineral Industry of the British Empire and Foreign Countries." It is now prepared by the Statistical Section of the Mineral Resources Division of Colonial Geological Surveys, transferred from the Imperial Institute to the Colonial Office in 1949. However, the format and contents have not been altered, and the tables cover again a seven-year period—the important and interesting years from 1942 to 1948. Its importance to economists, industrialists, mining engineers, geologists, technicians, and many other sections of the community interested in mineral and metal statistics is considerable and will be further enhanced when it will become possible to publish these summaries more promptly.

The present volume gives statistics of the production, imports and exports of over 50 minerals and metals. In the case of copper, lead, tin and zinc, tables are included showing the production of ore in terms of metal, in addition to smelter production. The section on coal deals also with coke, briquettes and the chief coal by-products and that on petroleum is concerned with crude petroleum, natural gasoline, natural gas, asphalt, oil shale and the chief refinery products. The iron and steel section gives information on iron ore, pig-iron, including ferro-alloys, and steel; further tables are also included sub-dividing these into various categories. The import and export tables refer not only to the crude minerals and metals, but also to the chief semi-manufactures.

Report of the Geological Survey Board for the year 1949.—Pp. 18. Published for the D.S.I.R. by H.M.S.O. Price 9d. net.

The twenty-ninth annual report on the work of the Geological Survey and Museum states that, once more, the bulk of the field work during the year under review has been carried out in the coalfields in close co-operation with the N.C.B. in the numerous schemes of systematic exploration and development now in hand. The chapter on Atomic Energy Investigation reveals that geological and mineralogical studies on the raw materials for atomic energy installations have occupied most of the attention of the Special Investigations Division of the Survey. Mineral and ore samples continue to be submitted in large numbers by government departments, mining companies, and prospectors from virtually every accessible country in the world. During 1949, the atomic energy laboratories conducted over three thousand radiometric analyses, some eight hundred of which proved sufficiently radio-active to merit further investigation. Mention is made in the report of the widespread distribution of thorite found in a field investigation of the alluvial tin fields of Nigeria; the identification of the uraninite-hydrocarbon aggregate, known as thucholite, from the old Laxey lead-zinc mine, Isle of Man; the occurrence of the same "mineral" in recoverable amounts, in many of the South African gold mines; the location of an uranium-bearing horizon in the potash beds of Yorkshire; a new find of the rare mineral called davidite in the Tete district of Mozambique, and the discovery of relatively high radio-activity in the Dolgelley Black Band

shales of North Wales. The report points out, however, that although various uranium-bearing rocks and minerals recently discovered in Britain are of considerable academic interest, none of the known occurrences is capable of being worked, save at a prohibitively high cost. The Board's short "Prospectors Handbook to Radioactive Mineral Deposits" has already had three editions. In co-operation with the Atomic Energy Research Establishment at Harwell, much attention has been given to the design and development of Geiger counters for geological research; and ratemeter equipment suitable for all types of radiometric field work, and for stope control in uranium mines, has now been delivered to the Colonial and several Dominion Geological Surveys as well as to certain mining houses with interests in the Colonies.

An Outline of the Industrial Reserves and Commercial Activities of Automatic Telephone & Electric Co. Ltd.—

The activities and world-wide interests of so renowned a manufacturing group as that comprised by the British-owned and operated Automatic Telephone & Electric Co. Ltd., the Telephone & General Trust, Ltd., and British Insulated Callender's Cables, Ltd., are in themselves an outstanding example of British business enterprise and technical and engineering skill, and any account of them must necessarily arouse more than usual interest. From such a vast background, the authors of this attractively presented publication have elected to deal with telecommunications as they have been developed in particular by the Automatic Telephone & Electric Co. Ltd. and its subsidiaries, though reference has also been made to the scope of the activities of the other "parent" organizations.

The first part of the booklet is devoted to admirably brief and succinct accounts of the activities of the more important members of the group. The Automatic Telephone Company, founded in 1912 and now the largest organization of its kind in the British Commonwealth, and primarily concerned with the design, manufacture, supply and insulation of "Strowger" automatic telephone exchange equipment; the British Insulated Callender's Cables, Ltd., concerned primarily with the manufacture of electric wire and cable, is also the largest of its kind in the British Commonwealth; Telephone & General Trust, Ltd., which is well established as a general investment trust, has particular interests in the development and financing of telephone operating companies overseas. British Telecommunications Research Ltd., serves to supplement the current research activities of the individual members of the Group; Hivac, Ltd., specializing originally in miniature valves, has now extended the scope of its activities to encompass the production of all forms of thermionic equipment, and Pioneer Telephone Manufacturing Co. Ltd., which has concentrated on the manufacture of inter-communication systems of the push-button type.

The descriptions of these companies and their association with the Automatic Telephone and Electric Company are clear and concise, and the authors must be congratulated on having resisted the temptation to clutter up the pages with an excess of detail. Well chosen illustrations of the various factories, buildings and work-rooms, add interest to the written account.

The latter half of the booklet contains an account of the "Strowger" automatic telephone system as developed by the Automatic Telephone & Electric Co. since 1912, and there is a short section devoted to the A.T.M. "special signal systems" division in which is included the company's well-known shaft and haulage signalling equipment; intrinsically safe telephones, bells, keys, etc.; safe linking equipment for use between underground and surface telephone systems. In this connection there is an illustration showing a seven-level A.T.M. shaft signalling indicator in a colliery winding room.

Technical Briefs

Longer-life Fluorescent Lamps

Claimed to have exceedingly long life—up to 10,000 hours under rigorous conditions—a new fluorescent lamp with a double cathode in place of the standard single cathode has been produced by the Duro-Test Corporation, says a Reuter message. The addition of Antimony 51 to the phosphor powder is said to be an effective activator which also reduces the tendency towards tube discoloration of standard lamps.

Refining U.S. Manganese—a New Process

A paper presented recently to the American Chemical Society by Dr. E. S. Nossen, director of research at the Nossen Laboratories, Paterson, dealt with a process evolved by him for refining the large deposits of manganese ore in Minnesota. It is claimed that if this process can be successfully used, it may mean that the U.S. will become independent of imported manganese ore.

Briefly, the process entails converting manganese ore to manganese monoxide and afterwards dissolving the resultant material in nitric acid. This process is claimed to be economical, as it provides for reclaiming the acid after it has been used. It was stated by Dr. Nossen that this method of refining manganese could be used with both the oxide and carbonate ores. He went on to say that another advantage of the process was that it enabled the recovery of a large amount of iron, which further reduced the cost of the manganese. Essentially the process developed by him was very simple and no complicated or unusual operating conditions were required. Gas reactions leading to the loss of valuable reagents were avoided, and the equipment required was of the standard type as used in many mining and metallurgical operations.

Continuous Casting and Rolling Process for Aluminium Rods.

For the first time, the continuous casting and rolling of aluminium rods has been achieved on a commercial scale, says the *Iron Age*, quoted by Reuter. The Properzi process, named after its Italian inventor, was first designed to handle lead and zinc. It employs a compact and relatively inexpensive machine which combines all the operations of a conventional rod mill. The machine, now in operation at Nichols Aluminium & Wire Co., Davenport, Ia., costs less than \$100,000 and needs a work area of only 60 by 100 ft.

Three induction furnaces melt the aluminium ingots and feed the wheel-type continuous casting machine, which produces a triangular semi-finished section. The section is automatically fed to a 15-stand continuous rod mill, which rolls coiled rod. Scrap loss is under one per cent and surface finish and mechanical properties are better than those achieved by conventional methods. The process is continuous and can be operated 24 hours a day. Savings in manpower are attractive: only three men handle the entire melting, casting and rolling operation at the Nichols' plant.

Boron in Alloy Steels

By using boron, an element not in short supply, in new alloy steels, the United States' steel industry will be able to cut its consumption of nickel, chromium and molybdenum by roughly 50 per cent, according to a technical committee of the American Iron and Steel Institute, quoted by Reuter. Boron assists in steel hardening when heat treated. Two series of the new steels—the development of which was started soon after the outbreak of the Korean war—with an alloy content almost half that of the "National Emergency" steels of the last war, had been

developed for most of the engineering and constructional purposes for which standard alloy steels were used. Both series contained an average of 0.30 per cent of nickel and 0.12 per cent of molybdenum. One series contained an average of 0.25 per cent of chromium, the other 0.43 per cent.

It is believed that the new steels will be five to six per cent cheaper than standard grades.

The five companies making the initial batches are: U.S. Steel, Bethlehem, Youngstown Sheet and Tube, Crucible and Wisconsin Steel—a subsidiary of International Harvester.

New Automatic Artificial Respiration Instrument

The M-S-A Pneolator, which now makes possible automatic artificial respiration without suction, is described in a new four-page bulletin, No. CH-2, published by the Mine Safety Appliances Company. This company is represented in the U.K. by Messrs. Mine Safety Appliances Co. Ltd., New Edinburgh Road, Glasgow, E.2, from whom further particulars may be obtained.

The Pneolator uses intermittent positive pressure to provide safe, uniform lung ventilation in cases of respiratory failure. In operation, it automatically inflates the lungs with oxygen in the right amount and at the right pressure for the unconscious person's physical requirements. No suction is employed, exhalation taking place by normal passive return of respiratory muscles in the lungs from the expanded state of inhalation. After voluntary breathing starts, the Pneolator serves as an inhalator to satisfy the patient's demand for oxygen. A second patient may be given simultaneous treatment by means of an auxiliary attachment with a separate control panel. It may be used not only in mines, but on all premises where danger from gases is present. Compact, and weighing only approximately 47 lb. complete, the Pneolator is contained in a strong, yet light, fibreglass carrying case.

First U.S. Oil-from-Coal Plant Completed

The completion of the major construction contract on the U.S. Bureau of Mines gas-synthesis demonstration plant at Louisiana, Missouri, an 80- to 100-bbl. a day unit that will convert coal to oil by a modified Fischer-Tropsch process, was announced by the Department of the Interior [See *Mechanical Engineering*, vol. 71, 1949, pp. 499-501]. The plant, the first of its type in the U.S., was built under the Bureau's synthetic-liquid-fuels research and development programme to translate laboratory data into cost and engineering information directly useful to industry in planning, building and operating commercial-scale installations (5,000 or more bbl. per day). Messrs. Koppers Company, Inc., Pittsburgh, Penn., held the \$4,915,000 design and construction contract, now completed. Integrated operations are expected to commence early this year.

According to J. J. Jaklitsch [*Mechanical Engineering*, October, 1950], this demonstration plant will gasify pulverized coal with oxygen and superheated steam, and then convert the resulting synthesis gas—a mixture of carbon monoxide and hydrogen—to liquid fuels by passing it over a catalyst. With American modifications, the Fischer-Tropsch process is well adapted to the production of a good grade motor gasoline and an excellent Diesel fuel. By-products include alcohols, wax, aliphatic acids and hydro-carbon gases. Any coal from anthracite to lignite may be used. In Germany, the use of this process increased gradually until January, 1944, when the capacity of the Fischer-Tropsch plants reached a war-time peak of 10,000 bbl. of product daily.

Metals, Minerals and Alloys

There is not much in the way of fresh news to report in regard to the metals this week, attention being principally centred on the digestion of the conservation and restriction orders both here and in the United States, and appraisal of how they will affect individual trades.

The U.S. \$10,000,000 Government subsidy to assist in the domestic exploration and development of scarce minerals is now in operation.

Copper.—From the beginning of March, copper use by American consumers was cut to 80 per cent of their base period, and for the second quarter of the year will be further reduced to 75 per cent, with a somewhat general expectation that complete allocation will be enforced by mid-summer. At present, defence orders have not come along with sufficient rapidity to keep pace with restriction on the use of the metal for ordinary civilian fabrication, and some dislocation of work is therefore resulting. Mr. James Patterson, who was prominent in opposing the re-imposition of the import duty last year, has stated that he has been advised that the Munitions Board has reduced stockpiling of copper by 50 per cent for an indefinite period. This is interpreted as meaning that the administration is permitting stockpile deliveries to be spread over an extended period, possibly up to June of next year.

U.K. imports in January were 32,088 tons (28,958 tons in December), of which 20,548 tons were electro and 11,540 tons blister. Shipments from the United States were up at 7,593 tons.

Lead.—In the United States demand for March delivery has far outstripped available supplies with little alleviation expected in April. The reason for this continued demand appears to be that while the inventories of consumers are restricted to two months' supply, most of them have not much more than a month's supply and may therefore continue to build up their inventories, or at least, try to do so. The U.K. is reported to have purchased some Mexican dollar lead, including 10,000 tons for shipment in the second half of the year; the export price was advanced last week to 19-19.50c. f.a.s. Gulf Ports. On the re-opened Commodity Exchange, May and July futures were done at 19c. U.S. production in January was about 600 tons, up at 48,887 tons with shipments to consumers 51,244 tons. Stocks fell to 33,232 tons (35,619 on December 31).

A general strike of some 90,000 Mexican miners was threatened for this week. They are demanding higher wages and social benefits. But the strike may be postponed owing to the necessity of securing Government approval for the strike, which may be withheld pending the outcome of negotiations.

U.K. imports in January were down to 10,733 tons, principally from Australia.

From France it is recorded that supplies are now adequate for all requirements and a decrease in the price from the current 130 francs per kilo is expected.

Tin.—Most of the steam seems to have gone out of the tin market with the recent blanketing of the United States buying in the East owing to the American ceilings. Chief interest in this regard centres on whether the R.F.C. is to become the sole importer, in which case the price ceilings might be by-passed. The Malayan output in January was 4,975 tons as compared with 4,699 tons in December. January outputs are apt to be high in view of arrangements for the Chinese New Year settlements early in February. The Indonesian output is reported as 2,335 tons, shipments being 2,339 tons; and the Belgian Congo as 1,080 tons. The International Tin Study Group estimates world production during 1950 at 165,100 tons

compared with 161,900 tons in 1949. Imports of tin into the U.S. are given as 82,637 tons of metal (60,234 in 1949) and 26,027 tons in concentrates (38,311). U.K. consumption is put at 22,850 tons (20,833 in 1949). Tinplate production last year is estimated at 5,703,000 tons, a record figure which compares with 4,525,000 tons in 1949. Hopes are entertained by United States' tinplate producers that there may be some increase in allocations during the second and third quarter to take care of the seasonal food pack. Here, the Government obtained a majority of ten on the debate on tinplate shortage on Tuesday. The Board of Trade is trying to cut down exports but is afraid of repercussions.

U.K. imports of tin metal in January were 380 tons and of concentrates, 2,946 tons, of which Bolivia supplied 1,709 tons and Nigeria 1,061 tons.

In a new effort to counter the bandit pest in Malaya, General Sir Harold Briggs has ordered the removal of all mine and rubber estate workers, estimated to number some 300,000, to special residential areas by May 1. Apart from possible labour dislocations, there is a question of who pays. At first, at any rate, the order will apply only to "controlled areas."

Zinc.—While the U.S. "official" price for zinc continues unchanged at 17.50c., it is thought that increases may be unavoidable if sufficient quantities are to be available to consumers to meet Defence Orders. Supplies of zinc in France have improved and the price has fallen from Frs.190 to Frs.170 per kilo.

The American-Anglo Transvaal Investment Corporation has secured an option on properties in the Murchison area of the Transvaal, of Murchison Copper and Zinc Holdings Ltd.

U.K. imports of zinc in January were 11,235 tons, of which about half came from Australia. Imports of concentrates totalled 11,117 tons.

Aluminium.—U.K. imports of aluminium in January were 6,946 tons, almost entirely from Canada. Imports of bauxite were 23,732 tons. The Kaiser Aluminium Corp.'s capacity has been raised to 270,000 tons a year by recent expansion.

Antimony.—U.K. imports of antimonial ore and concentrates in January were heavy at 3,041 tons or nearly a quarter of the imports for the whole of last year. French production in January was 142 tonnes. British and U.S. prices are unchanged.

Asbestos.—U.K. imports of asbestos in January totalled 6,496 tons. Principal shipments were from Canada, South Africa and Southern Rhodesia, in that order.

Cadmium.—U.K. imports of cadmium in January were 91,827 lb.

Cobalt.—U.K. imports of cobalt and alloys were heavy in January at 447,087 lb. compared with 255,395 lb. in December.

Manganese.—U.K. imports of manganese were exceptionally heavy in January and amounted to 65,729 tons, close on double the average monthly import rate last year. The Gold Coast supplied 36,280 tons, India 16,747 tons and South Africa 12,025 tons.

Molybdenum.—Imports of molybdenum concentrates into the U.K. in January were 388 tons.

Nickel.—Imports of Canadian concentrates and matte were heavy in January amounting to 4,543 tons, about double the average monthly rate last year.

Quicksilver.—150,000 tons of quicksilver ore were mined in Italy last year, and the output of metal was 1,645 tons. Domestic prices are said to vary between L.130,000 and L.160,000 per flask, ex-refinery. U.K. imports in January were 83,612 lb. or 1,100 flasks. The U.S. price is lower at \$210-215 nom.

Sulphur.—U.K. imports of sulphur in January were 29,223 tons, almost entirely from the United States. Pyrites imports were 17,732 tons.

Titanium.—U.K. imports of ilmenite were heavy in January amounting to 16,292 tons compared with 1,550 tons in December.

Tungsten.—It is reported from Lisbon that exporters are now asking Esc.135 per kilo for wolfram ex warehouse, equivalent to Esc.173 f.o.b. At this price many transactions are reported. In the United States an allocation order for tungsten concentrates is being drafted, and it is feared that if supplies do not increase tungsten consuming industries may be cut up to 60 per cent. Here the price is again higher and is called 675s. per unit c.i.f.

A start is being made this week by some U.S. steel companies in substituting boron-treated alloy steel in place of nickel, chrome, molybdenum and tungsten, which is said to have given highly encouraging results and to be somewhat more economical in costs.

U.K. imports of tungsten ores in January were 260 tons, of which 149 tons came from Portugal and 28 tons from Burma.

The London Metal Market

(From Our Metal Exchange Correspondent)

During the past week the European demand for tin has lessened considerably, and this has resulted in a fall in the prices in both Singapore and London, and the time when it will be possible for the Americans to re-enter the market appears to be very near. In the States demand has been quiet with metal changing hands at the top figure of \$1.83 per lb. and slightly less, and it is understood that the R.F.C. has sold several hundreds of tons during last week at their fixed price.

As it is understood that the American stockpile authorities have reduced the rate of intake of some other metals, it is hoped that some such action may be taken in the case of tin, in order to make additional supplies available to the world market and thus help to stabilize the price by making the markets less "thin," as in the main it has been the varying availability of metal which has caused the wide fluctuations in the past months.

The International Tin Study Group's figures published over the week-end show that the production of metal in 1950 was slightly higher than in 1949, and there is every reason to believe that the rate of production will again increase during the current year, provided there is no increasing unrest in the tin-producing areas of the Far East.

On Thursday the official price on the tin market was: Settlement price £1,450, Cash Buyers £1,445, Sellers £1,450; Three months' Buyers £1,375, Sellers £1,380. In the afternoon the market was steady. Turnover for the day was 160 tons. Approximate turnover for the week was 720 tons.

The Eastern price on Thursday morning was equivalent to £1,419 10s. per ton c.i.f. Europe.

Iron and Steel

The defences of the steel industry against inflation are down at last. A week ago the Minister of Supply authorized a general advance in prices to compensate iron and steel producers for the rise in their fuel bill. On the heels of that announcement came the news of the railway wage settlement which is estimated to cost £12,000,000 per annum. Exactly how this extra charge will be distributed has yet to be determined, but the general expectation is that the bulk of it will be covered by higher freight charges. And as the steel industry is the heaviest user of rail transport, steel will again be caught up in the inflationary spiral.

It is a discouraging start for the new Iron & Steel Corporation which is already deeply involved in the problems arising from the shortages of fuel, iron ore and scrap. Already ingot production is adversely affected and there are numerous warnings that last year's record output will not be repeated.

This is all the more disappointing since the demand for steel is greater than ever and is expected to increase still further, as the re-armament programme develops.

In the meantime detailed examination of the new price schedules, confirms a first impression that the authorized advances are singularly modest. Haematite iron is up 7s. per ton; foundry and basic iron 7s. 6d. and soft billets 7s. 6d., whilst the rises in finished steel prices range from 8s. per ton for steel joists and 8s. 6d. for steel plates to 15s. for heavy rails.

Much steeper advances are anticipated and buyers have not hesitated to follow the rise. Pressure for deliveries has not been relaxed in the slightest degree, and although a calamitous rail strike has been avoided, it is confessed that last week's unrest amongst the railway workers, although of brief duration, has had the effect of holding up urgently needed supplies.

The voluntary restriction of iron and steel exports seems to have been more honoured in the breach than the observance. At all events it is a fact that the January shipments of iron and steel totalled 264,100 tons or 32,000 tons more than in January, 1950. Even pig iron which is in desperately short supply to home consumers was exported in greater volume, whereas there was a further ominous shrinkage in the arrivals of foreign ore.

The position at the foundries has become very difficult. These establishments have an abundance of work in hand but they are gravely hampered by the shortage of pig iron. Nor is it only the higher grades which are scarce. The output of common foundry iron has also been reduced, so that the steel makers should not go short of basic iron, and the result is that most of the foundries are raiding their stocks to keep going.

Re-rollers are similarly dependent on a regular flow of semi-finished steel. Here the position has not undergone any further deterioration. The chief deficiency is in the supply of small billets, and it is hoped that this will be quickly overcome. It is noticeable, however, that works are now eager buyers of re-rolling scrap and defective material.

Tinplate.—Market conditions in sheets and tinplates have shown little change this week, apart from a slightly firmer tone for tinplate and sheet bars at the new prices of £17 6s. 6d. per ton. In the House of Commons on Tuesday, the Government was criticized on its tinplate policy, but on a division had a majority of 10. The Minister of Food announced a 50 per cent cut in tinplate shipments to the Argentine as from April 1 and a discontinuance of exports to Russia after the March quarter.

Coal

The Ministry of Fuel's output statement for the week ended February 24 is about the most encouraging issued by the Department for a very considerable period. It reveals a further improvement to 5.06 in the average weekly number of shifts worked per wage earner, a fall in the overall absenteeism rate from 13.48 per cent to 12.64 per cent, an addition of another 1,200 to the overall manpower—raising the industry's labour force from 688,600 to 699,100 since the beginning of the year, and a continuance of the coalface O.M.S. at the year's peak of 3.20 tons compared with 3.12 tons a year ago. The effect was the best week's deep-mined output this year, at 4,403,600 tons, representing a gain of 47,000 tons over the previous

week, and the still more impressive increase of 275,900 tons over the corresponding week in 1950 when 6,900 more workers were employed. Opencast production also improved slightly and the total saleable output amounted to 4,582,900 tons compared with 4,523,800 tons the previous week and with 4,339,000 a year ago. Target prospects are now steadily improving. Inclusive of imports (429,400 tons to date), our supplies over the eight weeks to February 24 have totalled 35,340,500 tons as against 34,215,300 tons in the corresponding period last year, and are thus for the first time bringing the achievement of the Attlee 3,000,000 tons objective within sight. Meanwhile, with production approximating consumption, stocks are being preserved, and at February 17 they still totalled 9,840,000. On our export trade, on the other hand, we are earning f.o.b. only about 40 per cent, what we did this time last year.

MARCH 1 PRICES

COPPER

Electrolytic...	£202 0 0 d/d
Fire refined, high conductivity ...	£202 0 0 d/d
Fire refined, high grade ...	£201 19 0 d/d
Fire refined, ordinary quality + 99.7% ...	£201 0 0 d/d
Fire refined, ordinary quality + 99.2% ...	£200 13 0 d/d

TIN

(See Metal Notes above for Thursday's Metal Exchange prices)

LEAD

Soft foreign, duty paid ...	£136 0 0 d/d
Soft empire, including secondary lead ...	£136 0 0 d/d
English lead ...	£137 10 0 d/d

ZINC

G.O.B. spelter, foreign, duty paid ...	£151 0 0 d/d
G.O.B. spelter, domestic ...	£151 0 0 d/d
Prime Western ...	£151 0 0 d/d
Electrolytic and refined zinc ...	£155 0 0 d/d
Zinc (99.99% Zn) ...	£157 0 0 d/d
Sheets ...	£167 0 0 ex works
Zinc oxide (red seal) ...	£170 0 0 d/d
Zinc oxide (green seal) ...	£171 10 0 d/d
Zinc oxide (white seal) ...	£172 10 0 d/d

ANTIMONY

English (99%) delivered,	
10 cwt. and over ...	£360 per ton
Crude, 10 cwt. and over ...	£275 per ton

NICKEL

99.5% (home trade)...	£406 per ton
-----------------------	--------------

OTHER METALS

Aluminium, £124 per ton.	Falladium (scrap), £8 oz.
Bismuth, 22s. 6d. lb.	Platinum, £27/33 5s. nom.
Cadmium, 17s. 3d./18s. lb.	Rhodium, £45 oz.
Chromium, 5s. 3d. lb.	Ruthenium, £30 oz.
Cobalt, 15s. 6d. lb.	Quicksilver, £73 10s. nom.
Gold, 248s. f.oz.	ex-warehouse.
Iridium, £65 oz. nom.	Selenium, 25s. nom. per lb.
Magnesium, 1s. 6d. - 2s. lb.	Silver (bar), 78½d. f.oz. spot
according to quantity.	and forward.
Osmiridium, £35 oz. nom.	Tellurium, 14s. 4d. lb.
Osmium, £70 oz. nom.	
Palladium, £8 10s. oz.	

ORES, ALLOYS, ETC.

Bismuth ...	40% 11s. per lb. c.i.f.
	30% 9s. 6d.
Chrome Ore—	
Rhodesian Metallurgical (lumpy)	£11 per ton c.i.f.
" " (concentrates)	£11 per ton c.i.f.
" " (refractory)	£10 12s. per ton c.i.f.
Baluchistan Metallurgical ...	£11 11s. per ton c.i.f.
Magnetite, ground calcined ...	£26 - £27 d/d
Magnetite, Raw ...	£10 - £11 d/d
Manganese, Best Indian ...	(Nominal)
Molybdenite (85% basis) ...	(Nominal)
Wolfram (65%), U.K. ...	675s. nom. c.i.f.
Tungsten Metal Powder ...	40s. 3d. nom. per lb. (home)
(for steel manufacture)	
Ferro-tungsten ...	38s. 3d. nom. per lb. (home)
Carbide, 4-cwt. lots ...	£30 18s. 9d. per ton
Ferro-manganese, home ...	£32 3s. 7d. per ton
Ferro-manganese, export ...	Nom.
Brass Wire ...	2s. 2½d.
Brass Tubes, solid drawn ...	1s. 9½d.

Mining Men and Matters

Mr. W. Balleny resigned from the Board of British Guiana Consolidated Goldfields on February 26, 1951, and Mr. Ward Leighton Morden and Mr. James Williamson Park, were appointed to the board as nominee directors of the Colonial Development Corporation.

Brigadier H. P. Crosland has been elected chairman of Metal Traders in succession to the late Mr. Frank L. Baer.

Mr. Richard Crawford has joined the Mine Safety Appliances Co., Queenslie Industrial Estate, Glasgow, as general sales manager, covering the whole of Britain and the Continent. Mr. Crawford, who had been Chief Electrical Engineer of the National Coal Board, before accepting this position on January 1, is President this year of the Association of Mining Electrical and Mechanical Engineers.

Mr. A. W. Morrison has been appointed a director of Powell Duffryn Carbon Products.

Dr. John F. Thompson, President of the International Nickel Co. of Canada, was elected chairman of the board of directors in succession to the late Mr. Robert C. Stanley. Dr. Thompson will continue as President, which office he has held since February 7, 1949. Dr. Paul D. Merica, executive vice-president and a director, was elected a member of both the executive committee and advisory committee of the company.

The Mining & Metallurgical Club Golfing Society will hold their annual meeting at the club premises on Tuesday, March 6, 1951, at 2.15 p.m.

Simon Carves have acquired the firm of Huntington Heberlein & Co., metallurgical, chemical and electrical engineers as a wholly owned subsidiary. Huntington Heberlein will retain their name and continue to operate from their registered office at 114, Cromwell Road, London, S.W.7. Their Board will now consist of three directors from Simon Carves, Mr. R. B. Potter (Chairman), Mr. J. P. V. Woolham (Managing Director) and Mr. N. Hinton and two directors from Huntington Heberlein, Mr. R. B. Bingham and Dr. F. J. Trotter.

Business Items

Timber Development Association, has announced that as from March 1, 1951 their address will be 21, College Hill, London, E.C.4.

The Hunstet Engine Co. has announced the receipt of an order from the National Coal Board for one 48-ton 18 in. by 24 in. 0-6-0ST "Austerity" locomotive, and for one 16 in. 0-6-0ST weighing 41 tons.

The Canadian International Trade Fair will again be held in the Exhibition Park, Toronto, Canada, from May 28 to June 8, 1951. It is learned that applications are exceeding expectations, and those received from U.K. manufacturers total well over 60,000 sq. ft. and may reach 70,000 sq. ft.

Philipp Bros. Inc., whose offices are at 70, Pine Street, New York City, N.Y., have announced the establishment of another foreign associated company. This company will be known as Philipp Bros. (Holland) N.V., with offices at Herengracht 532, Amsterdam. Dr. A. Blum, who was previously associated with the Buenos Aires affiliate of the company, will manage the associated company in the Netherlands. In addition to the New York and Holland offices, Philipp Bros. have associated companies in Canada, Peru, Bolivia, Brazil, India, Argentina, Hong Kong and Japan for trading in metals, ores, ferro-alloys and non-ferrous scrap.

Brush-Aboe Group's Commonwealth Scholarship Scheme.—The Brush-Aboe group of factories has just announced that engineering graduates from universities all over the Commonwealth may join in a new scholarship scheme for apprentice training in Britain. This scheme will allow for two years' study of the products and methods of production of the group and will prove to be of great value to the Commonwealth as a whole, and to the under-developed areas in particular, and steps were being taken to bring this scheme to the notice of the appropriate authorities in South and South-East Asia through the medium of the Council for Technical Co-operation, set up under the Colombo Plan. Free return passage from the apprentice's home to England will be provided, together with additional travelling expenses. Wages will be the same as those paid to other graduate apprentices at present working at the group's factories. An illustrated brochure, giving full details and containing an application form, may be obtained from the Brush-Aboe Group, 32, Duke's Court, Duke Street, London, S.W.1.

The Mining Markets

(By Our Stock Exchange Correspondent)

While the volume of business was again below that of the previous week, there was still a considerable turnover. Gilt edged stocks which earlier in the week had continued their downward trend showed definite signs of recovery during Tuesday and Wednesday. Selling of the new steel stock dried up and there was some inquiry for colonial and corporation issues.

Kaffir shares have maintained their steady improvement of the last two months. Overseas buying is again reported and some re-awakening of interest has also occurred in London. There seems little doubt that the industry is receiving considerable financial benefit from the sale of gold at premium prices. In a written Parliamentary reply last week, the South African Minister of Finance stated that although the amount of gold sold on the open market varied periodically, it had averaged about 40 per cent in recent months. Van Dyk and Doornfontein were again in demand on development hopes and the shares prices jumped accordingly.

O.F.S. issues have been a firm market. Interest appears to be stirring as the mines draw nearer to the production stage and St. Helena and Welkom lead the way. As soon as milling starts, a new stage will be reached in the development of this field, and it seems reasonable to anticipate a growing interest from the investing public.

Another market which has displayed an all round improvement is Eastern tin shares. Despite fluctuations in the price of the metal caused by cessation of American buying, and reports of the discovery in the United States of a process which may effect considerable economies in the use of the metal, several leading producers showed rises of one shilling and over. This can be attributed to more cheerful news of events in Malaya. The Colonial Secretary, speaking in the House of Commons, reported a grow-

ing confidence in the forces of law and order among the native population, especially the Chinese. He also said that information and assistance were daily being more freely offered to the authorities.

Nigerian issues attracted some selective demand. Gold and Base Metal Mines were firmer on rumours of forthcoming developments with American Smelting over the former company's lead/zinc proposition. Jantar and Bisichi also showed small gains. Both companies are producers of columbite, a mineral much used in rearmament and presently in short supply.

Oil shares encountered a certain amount of profit taking but most issues finished higher on the week. Trinidad shares, at one time subdued owing to riots in the neighbouring island of Grenada, later recovered. Ultramar was a good feature and there was a considerable turnover. Anglo Iranian rose on hopes of ratification of the 1949 supplemental oil agreement. This was turned down some time ago by the Persian Parliament's Oil Commission. It is reported that the British Ambassador has been discussing the matter with the Persian Prime Minister.

Base metal shares other than tin have tended to be irregular. Coppers were rather quiet. Few fresh buyers appeared, but the undertone was generally firm. Messina improved on talk of a possible scrip bonus on a one for one basis. The market in these "heavy" shares is always rather a limited one and such a step would certainly help the dealing position.

Lead/zinc shares were an easier market, but Burma Corporation and Mawchi were bright spots on renewed hopes of a settlement in Burma.

Australian gold shares were a neglected market with a dull trend. Fresh rumours of a possible revaluation of the £A have come to the fore. West Africans were steadier but very little turnover is reported. Diamond shares again came into demand and there was a strong market.

FINANCE		Price	+ or -	O.F.S.		Price	+ or -	MISCELLANEOUS GOLD		Price	+ or -	TIN (Nigerian and		Price	+ or -
		Feb. 28	on week			Feb. 28	on week			Feb. 28	on week			Feb. 28	on week
African & European.		3 1/2	+	Alpha F.S.A.		13 1/2	+	(contd)		5/10	+	Miscellaneous		12 1/2	+
Anglo American Corp.		8 1/2	+	Blinkpool.		26 1/10	+	Rhodesian		8/9	+	Amalgamated Tin		26 1/2	+
Anglo-French		25 1/2	+	Central Mining F.S.		5/10 1/4	+	London & Rhodesian		5/10 1/4	+	Beralt Tin		26 1/2	+
Anglo Transvaal Consol.		42 1/2	+	Freddies		17 1/2	+	Motapa		3/9	+	Bisichi		4/10 1/4	+
Camp Bird		15 1/2	+	Freddies N.		17 1/2	+	Mysore		7/6	+	British Tin Inv.		17/10 x	+
Central Mining (A) shares		48 1/4	+	Freddies S.		17 1/2	+	New Guinea		1/9	+	E.S. Lands Nigeria		7/10 1/4	+
Consolidated Goldfields		2 1/2	+	F.S. Geduld		11 1/2	+	Nunddroog		9/9	+	Geevor Tin		18 1/2	+
Consol. Mines Selection		36 1/10 x	+	Geoffries		19 1/2	+	Oreogin		3/9	+	Gold & Base Metal		3 1/2	+
East Rand Consols.		4 1/4	+	Harmony		26 1/2	+	Oreogin		1/1	+	Lauria Nigeria		8 1/2	+
General Mining		6 1/2	+	Ladenburg Estates		11 1/2	+	Oreogin		1/1	+	Lauria Tin Area		11 1/2 x	+
H.E. Prop.		38 1/2	+	Middle Wits		22 1/2	+	Oreogin		1/1	+	Kaduna Prospector		7 1/2	+
Henderson's Transvaal		15 1/4	+	President Brand		2 1/2	+	Oreogin		1/1	+	Kaduna Syndicate		15 1/2	+
Johnnies		3 1/2	+	President Steyn		18 1/2	+	Oreogin		1/1	+	London Tin		5 1/2	+
Rand Mines		7 1/2	+	St. Helena		36 1/10	+	Oreogin		1/1	+	United Tin		2 1/2	+
Rand Selection		41 1/10	+	U.P.S.C. & G.		11 1/2	+	Oreogin		1/1	+				
Union Corporation		12 1/2	+	Virginia Deb.		70	+	Oreogin		1/1	+				
Verreuning Estates		5 1/2	+	Virginia Ord.		14 1/2	+	Oreogin		1/1	+				
Wits.		35 1/2	+	Welkom		46 1/2	+	Oreogin		1/1	+				
West Wits.		2 1/2	+	Western Holdings		3 1/2	+	Oreogin		1/1	+				
RAND GOLD				WEST AFRICAN GOLD				COPPER				SILVER, LEAD, ZINC			
Blyvoors		53 1/2	+	Amalgamated Basket		2 1/2	+	Chartered		67 3/4 x	+	Broken Hill South		55 1/2	+
Brakpan		23 1/2	+	Ariston		7 1/2	+	Indian Copper		5/0	+	Burma Corporation		4 1/2	+
City Deep		3 1/2	+	Ashanti		30 1/2	+	Messina		113 1/2	+	Consol. Zinc		33 1/2	+
Consol. Main Reef		2 1/2	+	Bibiani		11 1/2	+	Nchanga		6 1/2	+	Lake George		27 1/2	+
Crown		5 1/2	+	Bremang		3 1/2	+	Rhod. Anglo-American		59 1/2	+	Mining Trust		5 1/2	+
Dagdas		3 1/2	+	G.C. Main Reef		3 1/2	+	Rhodesian Selection		21 1/2	+	Mount Isa		39 1/2	+
Dominion Reefs		2 1/2	+	G.C. Selection Trust		8 1/2	+	Rhokana		21 1/2	+	New Broken Hill		29 1/4	+
Doornfontein		34 1/4	+	Kutsongo		2 1/2	+	Rio Tinto		24 1/2	+	North Broken Hill		73 1/2	+
Durban Deep		4 1/2	+	Kwahu		2 1/2	+	Roan Antelope		47 1/2	+	Rhodesian Broken Hill		21 1/2	+
E. Dagdas		28 1/2	+	London & African Mng.		1 1/2	+	Selection Trust		10 1/2	+	San Francisco Mines		65 1/2	+
E. Geduld		4 1/2	+	Lyndhurst Deep		1 1/2	+	Tanks		46 1/2	+	Trepca		3 1/2	+
E. Rand Props.		4 1/2	+	Marlin		2 1/2	+	Tharsis Sulphur Br.		57 1/2	+				
Geduld		7 1/2	+	Nanwa		1 1/2	+					BASE METALS & COAL			
Grootevlei		41 1/10	+	Taqaah & Abosso		8 1/4	+	Anglo-Burma		5 1/2	+	3d Amal. Collieries of S.A.		3 1/2	+
Lihanon		18 1/2	+					Ayer Hitam		26 1/2	+	Associated Manganese		76 1/2	+
Limpards Vlei		24 1/2	+	AUSTRALIAN GOLD				Bangat		35 1/2	+	Chinese Engineering		2 1/2	+
Marievale		22 1/2	+	Boulder Perseverance		4 1/2	+	Gopeng		16 1/2	+	C.P. Manganese		59 1/2	+
Modderfontein B.		6 1/2	+	Gold Mines of Kaloorie		16 1/2	+	Hongkong		15 1/2	+	Catal Navigation		5 1/2	+
Modderfontein East		2 1/2	+	Great Western Consol.		7 1/2	+	Ipoh		12 1/2	+	3d Wankle		21 1/2	+
New Kleinfontein		22 1/2	+	Lake View and Star		22 1/2	+	Kamunting		12 1/2	+	Wubank Colliery		4 1/2	+
New Pioneer		22 1/2	+	Mount Morgan		21 1/2 x	+	Kemping		15 1/2	+	CANADIAN MINES			
Randfontein		21 1/2	+	North Kalguri		19 1/4	+	Kinta Tin Mines		18 1/2	+	Dome		\$30	+
Robinson Deep		18 1/2	+	Parings		1 1/2	+	Kramat Pulai		4 1/2	+	Hudson Bay Mining		\$122	+
Rose Deep		42 1/2	+	Sons of Gwalia		15 1/2	+	Malayan Dredging		27 1/2	+	International Nickel		\$75 1/2	+
Simmer & Jack		5 1/2	+	South Kalguri		10 1/2	+	Pahang		17 1/4	+	Miner Corp. of Canada		68 1/2	+
Springs		13 1/2	+	Western Mining		10 1/2	+	Pengkalen		11 1/4 x	+	Noranda		\$181	+
St. Nigel		3 1/2	+	Witwatersrand		11 1/4	+	Petaling		13 1/2 x	+	Quemont		£10	+
Van Dyk		21 1/2	+					Rambutan		21 1/2	+				
Venterspost		33 1/4	+	MISCELLANEOUS GOLD				Siamese Kinta		21 1/2	+	OIL			
Vlakfontein		22 1/2	+	3d Amal. Collieries of S.A.		3 1/2	+	Southern Kinta		18 1/2	+	Anglo-Iranian		6 1/2	+
Voerdriftshut		27 1/2	+	3d Champion Reef		11 1/2	+	S. Malayan		31 1/2	+	Apex		45 1/2	+
West Drifontein		5 1/2	+	3d Globe & Phoenix		24 1/2	+	S. Trench		26 1/2	+	Attack		26 1/2	+
W. Rand Consolidated		48 1/4	+					Sungei Kinta		20 1/2 x	+	3d Burnham		61 1/2	+
West Reefs		41 1/2	+					Tekka Taiping		32 1/2	+	3d Canadian Eagle		34 1/2	+
												3d Mexican Eagle		24 1/10	+
												+1/2 Shell		4 1/2	+
												Trinidad Leasehold		27 1/2	+
												+3d T.P.D.		32 1/2	+
												+9d Ultramar		35 1/2	+

Company News & Views

Loraine Gold Flotation—

Details of the Loraine Gold Mines flotation, which were announced last October are further supplemented by the news that work on the company's property of approximately 5,163 claims over the western portion of the Wit Extensions ground to the north of Freddie's North is progressing and that the flotation is now to take place.

Loraine Gold Mines has an authorized capital of £5,500,000 divided into 11,000,000 shares of 10s. each, of which 6,000,000 shares are to be issued initially, and 5,000,000 shares will be held in reserve.

Shareholders in Wit Extensions registered on March 13 next, will be offered five Loraine 10s. shares at par for every four shares held in Wit Extensions. Shareholders in Orange Free State Investment Trust ("Ofsits") registered on the same date, will be offered one Loraine 10s. share at par for every five shares held in "Ofsits."

The vendors, Orange Free State Investment Trust, Wit Extensions, Anglo American Corporation of South Africa, and South African Mines Selection have converted the £300,000 in cash which they received as vendors consideration into 600,000 Loraine shares. The remaining 5,400,000 shares are being subscribed at par. The offer to Orange Free State Investment Trust will absorb 1,600,000 shares and that to Wit Extensions 1,995,376 shares.

In addition to the western lease area, that is, the 5,163 claims mentioned above, Loraine Gold Mines will also acquire the mineral rights of the farms covered by the lease and certain farms adjoining the northern and north-western boundaries of the lease, and an option to purchase the mineral rights of a farm lying immediately north of the lease area.

—Jeannette Gold Mines

It is also announced that Jeannette Gold Mines, which will operate the eastern portion of the Wit Extensions block has also been registered with an authorized capital of £5,500,000 in 11,000,000 shares of 10s. each, of which it is intended to issue 6,000,000 shares initially. A substantial number of these shares, it is stated, will be offered to shareholders of Wit Extensions and "Ofsits."

These two mines, which are members of the Anglo American Corporation group have already begun opening up their properties. The shaft collar has been completed for No. 1 shaft on Loraine Gold and shaft sinking has begun. At Jeannette the shaft collar has been cut.

Zambesia Exploring Raises Dividend

The profit and loss account for the year ended December 31, 1950, of Zambesia Exploring showed that gross revenue had increased by £58,316 to £181,001. This large increase was chiefly due to share-dealing profits which rose to £101,920 against £57,326, reflecting the sales of Tanganyika Preference at a substantial profit, although income from dividends was higher at £78,231 compared with £60,880 previously. After providing for all expenses, net profit worked out at £78,533 compared with £57,909 in 1949. To the net figure was added £65,269 brought in making £143,802 available. Nil, against £25,000, was transferred to general reserve, but the distribution, which for the previous three years had been nine per cent, was raised to 13 per cent (which included a five per cent bonus), leaving the remainder, £81,931, to be carried forward, which compares with the £65,269 in 1949.

Up to last October the company had direct shareholdings in Tanganyika Concessions, Kenton Gold Areas, Geita Gold Mining, Uruwira Minerals, Central Mineral Exploration, East African Concessions and Rhodesia-Katanga. Additionally, the company held debenture stock of Geita Gold, and had loaned that company £300,000. These

investments, with the exception of the Tanganyika Concessions' holding, were transferred to a new company, Tanganyika Holdings, in which Zambesia Exploring has a 50 per cent participation in the share and loan capitals. In December of last year, a wholly owned subsidiary was formed by the company to acquire some of its Tanganyika Concessions' holding. This newly formed and wholly owned subsidiary, Zambesia Investment, holds 361,659 eight per cent cumulative redeemable Preference shares at 16s., and 216,995 Ordinary stock units of 10s. in Tanganyika Concessions, leaving the parent company to hold a total of 268,181 "Tanks" stock units.

Some Developments in Western Australia

Central Norseman Gold Corporation reported that the Princess Royal shaft intersected a flat reef at a depth of 403 ft., and that six samples averaged 198 dwt. gold per ton over a width of 72 in. The report issued is for December last and shows that 12,068 tons of ore were treated during the month for the recovery of 3,022 oz. Sinking of the new Regent shaft has reached a depth of 2,788 ft. Winzings from No. 25 level had reached a depth of 180 ft., the last 57 ft. being in low values; connection has been made to No. 27 level. At No. 27 level, section 61 south drive reached 527 ft. in quartz, the last 96 ft. assaying 5.8 dwt. over 50 in. Section 70 north drive had advanced 99 ft., ore from 45 ft. to the face assaying 15.0 dwt. over a width of 63 in. The Princess Royal shaft had reached a depth of 410 ft. and a plat is being cut at 400 ft., where the high-grade flat reef was met. Bulk samples of ore and mullock from this work, sent to the mill, averaged 130 dwt. per ton.

Attention is being given to the lead deposits of the State and Anglo Westralian Mining Pty. Ltd., an offshoot of Big Bell Mines Ltd., has exercised an option to purchase taken in June, 1950, over the Protheroe lead mine. During the period of the option, considerable driving was done at the 325 ft. level, and three winzes sunk to a horizon 100 ft. below the 325 ft. level, and drives extended from them. A modern gravity and flotation concentration plant is being built with a capacity of 80 tons of ore per day. It is expected that the mill will be operating by the middle of 1951.

New Coolgardie Gold Mines has reported December's mill throughput as 3,861 tons of ore and the recovery 1,756 f.oz. of gold. Included in the total are 40 tons of development ore from Burbanks, 272 tons of development ore from Hampton and 160 tons from Callion. At the Surprise mine, the main shaft has reached a depth of 433 ft. In the Barbara mine, the east drive on the South lode, at the No. 3 level, has reached 85 ft.; from 18 ft. to 70 ft., the average value was 24.2 dwt. per ton over 63 in. At the Callion mine, sinking of the main shaft has been recommenced.

At Great Western Consolidated, the main shaft on the Copperhead mine has reached a depth of 369 ft. below collar, and stope preparation is going on at the 250 ft. level. The most notable development is in the Southern Series, where a borehole drilled north of the exposures made by development, cut 14 ft. of ore assaying 4.8 dwt., and 27 ft. assaying 6.4 dwt. gold per ton.

Central Victoria's Amphitheatre Dredge

When the second dredge of Central Victoria Dredging Co., which will operate at Amphitheatre, commences work, the company will have spent approximately £A:00,000 on this, and the Jim Crow area. The Amphitheatre dredge, which originally worked on Victoria Gold Dredging Co.'s leases at Newstead, is expected to commence dredging about the middle of the year. The Jim Crow dredge has been working in marginal ground, not included in estimated reserves, with a value between 1.3 and 1.6 gr. gold per cu. yd., but is now being turned and is expected to re-enter the selected area early in the year.

Company Shorts

British South Africa Co. have announced that there is likely to be considerable delay in the publication of their accounts, due mainly to having to conform to the provisions of the Companies Act, 1948. The directors have, however, sufficient knowledge of the year's operations to enable them to decide what dividend should be declared. They have, therefore, decided to exercise their powers under the company's Deed of Settlement to pay members from time to time such interim dividends as in their judgment the position of the company justifies and to declare the payment as an interim dividend of the full amount of dividend which they would normally have recommended to the annual meeting.

Accordingly, an interim dividend of 33½ per cent, less tax (same) on the company's registered stock and 5s. per share, less tax (same), on the company's Ordinary shares is to be paid on March 31, 1951, to all members registered in the books of the company on February 23, 1951. The net U.K. rate of income tax in respect of the dividend is 4s. 5d. in the £.

Milling Suspended at Paringa.—Paringa Mining and Exploration have officially announced that milling operations were suspended on January 16, 1951, to obviate losses which were being incurred due to the low-grade ore treated and the continual increase in operating costs.

During the year to August 31, 1950, the mill treated 96,506 tons, revenue amounting to £220,807 and mining and milling costs to £213,855. It is estimated that operations during this period will, after charging £34,300 for all expenditure on mine development and allowing for plant depreciation, London expenses and sundry revenue, show a loss of about £35,000.

In the four-and-a-half months to January 16, 1951, 36,178 tons were treated, revenue amounting to £78,597 and costs to £96,611.

It is confirmed that arrangements have been made with Mount Charlotte (Kalgoorlie) Gold Mines for trial crushings of approximately 25,000 tons of development rock from that company's surface dump. The resumption of milling of Paringa ore will depend, it is further stated, upon results of the present plan of mine development.

Progress at New Guinea Goldfields.—New Guinea Goldfields which was incorporated in New South Wales in 1929 owns claims amounting to about eight square miles on the Edie Plateau, New Guinea, and rehabilitation of its property is now in progress. During the year ending September 30, 1950, revenue from bullion sales amounting to £80,796 was mainly derived from alluvial operations on Edie Creek, but considerable capital expenditure was incurred in developing the Golden Ridges lode, which gave encouraging results. Profit for the year after providing for all operating and administrative expenses, and £11,575 for depreciation, amounted to £4,903.

The chairman, Mr. J. Kruttschnitt, informs that the erection of the treatment plant at Golden Ridges was commenced during the year and it is expected that the mill will be in operation within the next few months.

Atta Gold awaits further developments.—At the last annual general meeting of Atta Gold & Co. (1928), a resolution was approved authorizing the directors to negotiate with the Cyprus Sulphur & Copper Co. for the purpose of investing the major part of the company's cash resources in that company's mine at Limni in Cyprus.

In the latest report and accounts of Atta Gold just published, the directors state that work at the Cyprus Sulphur & Copper mine has been so satisfactory as to warrant the ending of exploratory work, and that this company's finance is no longer required, but that the raising of capital for equipment and large-scale production is under consideration. The directors are keeping in touch with the position and should they be offered a further opportunity to secure an interest in the reorganized Cyprus Sulphur & Copper Co., full details of the offer would be submitted to shareholders before any action was taken. Finally, the directors point out that the only alternative to such proposals, if they should prove unacceptable, would appear to be the liquidation of the company.

Atta Gold's net current assets at the year ending February 28, 1950, amounted to £32,376. Mr. O. V. G. Hoare is chairman.

Rantau Tin Dredging have announced that the Malayan War Damage Claims Commission has assessed their claim and has awarded a total of £1,229,305. The War Damage Commission have made an initial payment of 60 per cent on the amount assessed, totalling £737,233, which Rantau Tin has set off against the Government rehabilitation loan of £562,075 to the extent of £214,702, and against the Industrial Rehabilitation Finance Board loan of £1,400,000 to the extent of £522,531.

Kaduna Syndicate is proposing to distribute one new 2s. share for every share held. This announcement was made in a circular to shareholders earlier this week and further stated that this decision had been taken to bring the company's issued capital, which is £48,000 into line with the amount of capital used in its business. In this connection it is pointed out that at the end of 1949 general reserves and unappropriated profits amounted to some £70,000, and it was therefore proposed to capitalize £48,000 of such reserves by the distribution of one new share for every one share held.

Kaduna Prospectors propose to capitalize £12,000 out of its reserves which at the end of 1949 stood at £18,424, or £424 more than the company's issued capital. As in the case of Kaduna Syndicate, the decision to capitalize part of such reserves is to bring the issued capital of the company more into line with the capital employed in the business. Accordingly, it is proposed to distribute two new shares for every three shares held.

Extraordinary general meetings of both companies will be held on March 15, to consider these proposals.

Ribon Valley (Nigeria) Tinfields Results.—Output of Ribon Valley (Nigeria) Tinfields for the year ending March 31, 1950, amounted to 87 tons averaging 73.6 per cent tin compared with 110.25 tons averaging 73.34 per cent metal in 1949. Working costs including transportation and royalty payments, increased £87 per ton to £401 per ton but the average price received increased by approximately £91 per ton to £622 10s. 4d., which brought tin revenue up to £39,860 against £42,942 previously. However, expenses amounted to £41,572, thus causing a loss on the year's operations of £1,712. The carry forward was reduced to £10,590.

With regard to Northern Nigeria (Bauchi) Tin Mines, which is a wholly owned subsidiary of Ribon Valley, the chairman, Mr. A. Hedley Williams, said that the Government had approved the company's scheme for a test paddock to open up the 2,391 tons of proved ore reserves. The trial paddock, it is expected, will uncover about 40 tons, leaving the main scheme dependent on the information obtained.

Esperanza Copper and Sulphur.—Esperanza Copper and Sulphur, which owns the entire share capital of Seville Sulphur & Copper and controls Cyprus Sulphur & Copper, is proposing that its capital be increased from £350,000 to £500,000 by the creation of 1,200,000 shares of 2s. 6d. each. The decision to increase its capital is to provide Cyprus Sulphur & Copper with working capital to continue its development work at Limni.

The Cyprus Sulphur & Copper Co. is indebted to the Esperanza Co. to the extent of £72,249, and to certain other creditors for sums totalling £63,535. Arrangements now being carried into effect, provide for a consolidation of the Cyprus company's capital, the waiving of preference arrears, the purchase by the Esperanza company from other creditors amounts due to them in consideration of the allotment of 605,485 Esperanza shares, and finally, the acceptance by Esperanza of 135,437 £1 shares in the reorganized capital of the Cyprus company in full satisfaction and discharge of the amount due, and the aggregate of the amounts to be purchased by the Esperanza company.

When these transactions have been completed, the capital of the Cyprus company will be £200,000 in £1 shares, of which £196,196 will be issued and fully paid.

The issued capital of the Esperanza company will be increased from £98,675 to £192,857, and the company will be the beneficial owner of the whole of the issued shares of the Cyprus company.

Rhokana Preference Shares.—Formal notice has now been sent to holders of the ½ per cent redeemable cumulative Preference shares of Rhokana Corporation of the offer to purchase their shares at 22s. per share, plus the net amount of the accrued dividend. This offer, which is being made by Rhodesian Anglo American, follows on the notice sent to shareholders on November 27 last, in which it was stated that the transfer of control of Rhokana to Northern Rhodesian might be disadvantageous to certain corporate holders of the company's Preference shares as dividends accruing to such holders will no longer be regarded as "franked investment income" but will be treated as income liable to profits tax. The offer will remain open until March 15, 1951, and the shares will be purchased for redemption.

The Scottish Australian Mining Company have announced that a further distribution will be made to stockholders out of contingency reserve no longer required at the rate of 9d. per unit on the 250,000 4s. units of Ordinary stock.

This distribution being out of capital realization, is not subject to income tax, will be paid on March 20, 1951. For this purpose, a balance would be struck at 4 p.m. on Tuesday, March 6, 1951.

Topical News in Brief

Foreigners in U.K. Mines.—Mr. Bevan recently stated that the recruitment of foreign miners to work in U.K. mines began in 1947 and there were now approximately 19,000 employed.

Solid Fuel Bureau Established in Poland.—The Presidium of the Polish Government has decided to set up a bureau for solid fuels to secure their rational and economic utilization.

Brazil Producing More Pig-Iron and Rolled Steel Products.—Output of the Volta Redonda steel plant for 1950 (figures for 1948 and 1949 in brackets) developed as follows (in thousands of tonnes): Pig-iron, 330 (224; 193); rolled steel products 287 (198; 227).

Brazil to Produce Sulphur from Coal.—Since Brazil is lacking deposits of suitable pyrites, it is intended to utilize South Brazilian coal, which contains from 40 to 50 per cent of sulphur, for the production of about 50,000 tonnes of sulphur per annum. The country depends at present entirely on U.S. supplies of sulphur.

Iron and Steel Project for Colombia.—A Reuter report from Paris states that a Franco-Belgian group is to participate in the setting up of a new iron and steel industrial combine in Colombia. The project, situated 200 kilometres from Bogota, will be financed by the Banque de Paris et des Pays-Bas; the engineering equipment to be supplied by an American firm.

Austria's Lignite Output to Increase.—In view of the general coal shortage in Europe, a new production plan has been prepared for Austria's lignite mining industry. Total output, which amounted to 4,490,000 tonnes of lignite in 1950, is to be increased by 380,000 tonnes in 1951. During the years 1952 and 1953, output is to be further stepped up by 500,000 tonnes for each year.

Venezuela to Make Steel.—The Venezuelan Government is completing plans for the construction of the country's first steel plant, reports Reuter. It is understood that work will begin before the end of March. Operations are expected to start early in 1953 and capacity will be 200 tons of steel daily. The site chosen for the plant is near San Felix, in the vicinity of the juncture of the Caroni and Orinoco rivers.

Australia to Survey Fuel and Power Resources.—The Australian Minister for National Development, Mr. Casey, has announced that a survey was to be made of all power and fuel resources and facilities throughout Australia. He said that all State Governments would be asked to co-operate. The Federal Government planned to spend £A200,000,000 during the next ten years on the development of Australia's electrical power supplies.

Spain to Promote Pyrite Export.—In Spain, a special office has been set up on which the Mining Board at Huelva and the Spanish Board of Trade are represented for the purpose of fostering the export of pyrites, the official price for which is at present 150 pesetas per tonne f.o.b. It will license ore exports and the imports of raw materials and machinery for the mines, imports to be covered by 15 per cent free currency proceeds from pyrites exports.

Rumania Erecting New Flotation Plants.—In Rumania, new flotation plants are being erected in Baia Sprie and Baita, and a new lead refinery is going up in Firiza. Zinc, lead, copper and gold occurrences in Northern Transylvania, particularly in the Baia Mare area, are to be utilized more extensively, and lignite deposits are to be opened up with the aid of mining equipment which has largely been brought in from the U.S.S.R.

East Germany to Produce More Non-Ferrous Metals.—Within the framework of East Germany's Five Year Plan, output from the Mansfeld copper deposits is to be increased from 840,000 tonnes in 1950 to 1,500,000 tonnes by 1955. Output of lead concentrates is to reach a target of 9,500 tonnes, as compared with 1,080 tonnes in 1950, and that of zinc concentrates is to amount to 450 tonnes (nil in 1950). Supplies of non-ferrous metals appear to be rather scarce in the country and an intensive scrap collection campaign is being conducted at present.

Swedish Aluminium Works Expansion Completed.—The new extension at the Swedish Aloxid works at Sundsvall, North Sweden, which is now completed, will enable the firm to increase its production of aluminium up to 2,000-4,000 tonnes a year.

Included in the new extension is a 150 metres long electrolysis hall containing 40 electric smelting furnaces of the latest type and a foundry with four large cylinders.

Brazil's Unprecedented Volume of Iron-Ore Shipments.—Brazil's exports of iron ore, via the port of Vitória, from the Itabira mines in the Rio Doce Valley during the year 1950 were 52 per cent higher than in 1949. The total, which reached the unprecedented volume of nearly 722,000 tonnes, includes only haematite iron ore with a content of more than 68 per cent of iron. The U.S.A. bought 588,000 tonnes, and other purchasers were Canada, the Netherlands, Great Britain, Germany and Belgium. Exports during 1951 are expected to reach 1,500,000 tonnes.

Krupp-Renn Plant for E. Transvaal.—Krupp, Essen, is to build a pig-iron plant in the Eastern Transvaal for a newly-formed South African company, according to the *Rand Daily Mail*. The plant will use the Krupp-Renn process, which, it is claimed, can treat low-grade and titaniferous iron ores, using low-quality coals instead of coke. Low-grade ores are not suitable for treatment in blast furnaces. The South African company holds option contracts over a large area of iron-bearing ground near Airline Station on the Johannesburg-Lourenço Marques railway line, where some 120,000,000 tons of iron ore are believed to exist.

New Open-Cast Coal Mine in N.S. Wales.—A new open-cast coal mine on the Lithgow field in western New South Wales is expected to yield at least 10,000 tons of coal a week when it goes into production in April. The mine, which covers an area of 200 acres at Ben Bullen, was lent for development by the New South Wales Government to the British firm of George Wimpey & Co., Ltd. Seven of the firm's experts have already arrived in Sydney and an executive, Mr. M. J. Bearman revealed that his company would be in Australia for three or four years. It was estimated that there was at least 2,250,000 tons of good quality coal at Ben Bullen.

H.R.H. Duchess of Kent visits Johnson Matthey.—Her Royal Highness the Duchess of Kent visited the platinum smelter and refinery of Johnson Matthey & Co. at Brimsdown, Middlesex, on February 22. The Duchess was conducted through the recently extended Brimsdown Works by Mr. H. W. P. Matthey.

At the conclusion of her tour, Mr. Matthey presented the Duchess with a jewelled compact in platinum and 18-carat gold alloy, which was unique in that the platinum used in its manufacture was taken from the very first output of the new refinery, while the gold was refined by Johnson & Sons from the same parcel of Welsh ore from which Her Royal Highness' wedding ring was produced.

OAKLAND

**WANTED REGULARLY
CONTAMINATED**

ZINC ORES containing CADMIUM
ZINC ORES containing COPPER
ZINC ORES containing LEAD

METAL COMPANY LIMITED
LONDON OFFICE: 94, New Bond Street, London, W.1

Telephone: GROsvenor 5241/4. Cables: AMOMET LONDON.
Telegrams: AMOMET WESDO LONDON.

COMPLEX ORES AND RESIDUES OF ANY KIND

OAKLAND WORKS • WILLINGTON • DERBY

Telephone: REPTON 391 and 392

Egyptian Reservoir Project Submitted by Sir Cyril S. Fox.—A report on the project, Wadi Rayan reservoir, has been submitted to the Egyptian Minister of Public Works by Sir Cyril S. Fox, consulting engineer, geologist to the Egyptian Government. Estimated cost of the project is about £E.20,000,000, according to Ministry officials, quoted by Reuter. The project would store large water surpluses from the annual Nile flood. Sir Cyril's study includes the infiltration of waters from the Wadi Rayan area into the soil of the Fayoum province. The construction of a reservoir at Wadi Rayan has been broached off and on since 1885, but only in 1943 was it given serious consideration.

Tunisian Mineral Output, 1950.—Particulars of the production of minerals in Tunis last year have been reported by Reuter, which indicate some increase in production of the principal mineral ores. Lead mines' production for the year was 30,658 tons, or about the same as in 1938. Refiners produced 23,536 tons compared with 19,505 tons in 1949. Mine production of zinc totalled 5,262 tons compared with 6,144 tons in 1949. Production of iron ore during 1950 amounted to 757,897 tons compared with 711,894 tons in 1949. Phosphate production in Tunisia amounted to 125,487 tons in December compared with 115,268 tons in November.

New Brazilian Import Regulations.—Machinery, apparatus, instruments, spare parts and other materials for the exploitation and industrialization of minerals may be imported into Brazil without prior licence, subject to previous approval by the Ministry of Agriculture. Quantities will be limited only by the amount of exchange available. The detailed list of materials exempted includes equipment for cement factories, for surface and underground mining, for iron and steel-works and metallurgical industries in general.

As regards imports for which prior licences are required, those payable in sterling, Swedish crowns, U.S. dollars and Swiss francs are restricted during the first half of 1951 to products expressly mentioned in a list published in the *Diario Oficial* on February 13, 1951. Further particulars of the items appearing in this list may be obtained from the Editor of *The Mining Journal*.

Pakistan Lignite Deposits.—Recent geological surveys have indicated that the thick black mud, which lies exposed for miles along the riverbeds of East Bengal when the waters are low, is composed largely of carbon and will burn freely if properly dried. If experiments with this new find prove successful, East Pakistan's search for a cheap fuel might be over, states a Reuter report from Karachi.

The country's annual coal consumption is 1,920,000 tons, but production totals merely 400,000 tons. East Pakistan alone requires 840,000 tons annually and has to import it from Poland, France, the U.K. and South Africa. Deliveries from India, formerly Pakistan's greatest source of coal, stopped over a year ago during the trade deadlock between the two countries; since then, East Pakistan has suffered from a continuous coal shortage.

Geologists are now prospecting an area near Harashpur, not far from Brahmanbaria. Last year, they found a minimum of 9 ft. of lignite over a large area below a few feet of alluvial clay. With better equipment this year, they have already got to the bottom of the lignite and have found 15 ft. to be the minimum thickness. This indicates that in a very accessible area there are some 200,000,000 tons of lignite. Geologists agree that this could easily and cheaply be excavated. However, Dr. H. Crookshank, Director of the Geological Survey of Pakistan, states that more investigations will have to be made.

Plans of Abandoned Mines.—The Minister of Fuel and Power has made arrangements with the National Coal Board to act as his agents in holding the plans of abandoned mines and seams of coal, deposited for preservation under Section 21 of the Coal Mines' Act, 1911. The transfer of the plans from the Ministry's Mining Records Office at Buxton has been going on during the past 12 months, and is now complete.

So that the plans may be readily accessible to persons who have occasion to consult them, each Division of the National Coal Board will be responsible for holding the plans relating to mines in the Division. The addresses of the premises where the plans are stored and of the officer to whom application to inspect plans should be made, will be supplied, on request, by any of the Divisional Officers of the National Coal Board, or H.M. Inspector of Mines, or at the Headquarters of the National Coal Board or the Ministry of Fuel and Power.

Plans deposited under the Coal Mines' Act of abandoned mines and seams of other minerals (i.e. shale, fireclay and stratified ironstone), and plans deposited under Section 14 of the Metalliferous Mines Regulation Act, 1872, have been transferred from Buxton to London. Applications to consult these should be addressed to the Officer-in-Charge, Mining Record Office, Ministry of Fuel and Power, King's Buildings, Dean Stanley Street, London, S.W.1.

THE ZAMBESIA EXPLORING CO. LTD.

The Annual General Meeting of The Zambia Exploring Co., Ltd., was held on February 23rd, 1951, at 20, Aldermanbury, E.C.2. Sir Ulric Alexander, G.C.V.O., K.C.B., C.M.G., O.B.E. (the Chairman), who presided said:

This is the first occasion I have had the honour of presiding at your Annual General Meeting and as the composition of the Board has changed so markedly since your meeting last year, owing to the resignation of your late Chairman, I feel it is one of my first duties to explain how these changes came about.

I do not think, however, they can have taken you entirely by surprise, as you will remember Mr. Hely-Hutchinson referred to some such possibility at the Annual General Meeting last May. He already foresaw that in any capital reorganization of Tanganyika Concessions there would be some conflict of interests between the Preference and Ordinary Stockholders. Your Company being a large holder of the Preference, Mr. Hely-Hutchinson decided he could not continue to be Chairman of both Companies, and that some Member of your Board who was not on the Board of the Tanganyika Co., and would therefore have a free hand in any negotiations, should succeed him. He therefore resigned the Chairmanship, but to the satisfaction of all his colleagues, he consented to continue to serve as a Director. In this way, your Board much hoped that they would continue to have the advantage of Mr. Hely-Hutchinson's valuable advice, and it was a loss which was keenly felt by all his colleagues when he decided a little later his work and responsibilities in other spheres had so greatly increased that he reluctantly felt obliged to resign from the Board.

I should here like to record the valuable services Mr. Hely-Hutchinson gave to the Company during his leadership.

If you look back, you will find that during the period of his Chairmanship there has been steady and undisturbed progress in the Company's business, culminating in the present results, which I feel stockholders will agree with me are not unsatisfactory.

By his resignation, your Board feel they have lost a very valuable colleague, whose guidance and handling of the Company's affairs was of the highest order in the interest of stockholders.

The following are extracts from the Directors' Report and Chairman's Review circulated with the Report:

The profit, after deduction of £3,500 for United Kingdom taxation, arrived at after allowing £179,787 in respect of sale of shares to Tanganyika Holdings Ltd., as a loss for taxation purposes and including an amount of £86,475 written off in respect of such loss on sale, amounted to £78,533, to which has been added the balance of £65,269 brought forward from 1949. From the resulting total of £143,802 an interim dividend of 3 per cent less tax, has been paid and provision made for the proposed payment of a final dividend of 5 per cent and a bonus of 5 per cent, both less tax. After these appropriations there remains a balance to be carried forward of £81,931. 361,659 8 per cent Cumulative Redeemable Preference Shares and 216,995 Ordinary Stock Units of Tanganyika Concessions Ltd. receive in exchange for old Preference Stock under that Company's Capital Reorganization scheme, have been sold to a wholly-owned subsidiary Company, The Zambia Investment Co., Ltd., to be held as a fixed investment.

The Company's interests in Geita Gold Mining Co., Ltd., Kentan Gold Areas Ltd., Rhodesia-Katanga Co., Ltd. and Uruwira Minerals Ltd., have been sold to Tanganyika Holdings Ltd., and a 50 per cent interest in the share and loan capital of the latter Company is now held.

TANGANYIKA CONCESSIONS LTD.

For the year ended July 31, 1950 results showed a profit of £589,022, after providing £186,563 for taxation. Dividends were paid on the Preference Stock and the Ordinary Stock at the rate of 10 per cent and 12 per cent respectively, less tax, in October last. Union Minière du Haut Katanga paid, during 1950, a dividend of Frs.480 net per share for the year 1949.

GEITA GOLD MINING CO., LTD.

Gold production for the year ended June 30, 1950 was 30,524 oz. as compared with 28,038 oz. for the year ended June 30, 1949. For the six months to December 31, 1950 the output was 16,334 oz. of gold. The estimated ore reserves at June 30, 1950 were 2,280,456 tons at 3.8 dwt. per ton, compared with 1,612,684 tons at 3.9 dwt. per ton at June 30, 1949.

The report and accounts were adopted.

BRITISH GUIANA CONSOLIDATED GOLDFIELDS

NEW CAPITAL FOR EXPANDING ACTIVITIES

The Fifteenth Annual General Meeting of British Guiana Consolidated Goldfields, Ltd. was held on Monday last in London.

Mr. J. Roland Robinson, M.P., the chairman, in the course of his speech, said: The proceeds of the year's gold production have dropped as compared with last year by £9,600, despite the increase of 68s. 1½d. per ounce in the average net price realized, following the devaluation of sterling in September, 1949. The chief reason for this drop is that the ground in which the Waddington Dredge was working in the Upper Mahdia area only produced 2.51 grains fine of gold per cu. yd., compared with 3.66 grains in the previous year, i.e., our dredging work earned 6d. per cu. yd. less than would have been the case if we had worked in ground of a similar richness to the previous year. In addition, the yardage dredged was slightly lower by approximately 100,000 cu. yd.

Proposals will be submitted to an extraordinary general meeting of the members of our company which will be held at the conclusion of this meeting. It is estimated that a sum of £562,000 more will be required: (a) to complete the Lower Potaro River programme; (b) to purchase and install a new dredge and the power equipment required for the Konawaruk River project, and to finance the necessary development work; and (c) to carry out the prospecting programme in the other areas now waiting investigation.

There is no doubt that in the normal way the task of raising this money would be beyond the power of the company. However, your directors have been able to reach an agreement with the Colonial Development Corporation which ensures the raising of this sum. We believe it to be fair, and we recommend it to you; £89,257 10s. of this money will be raised by the issue of 892,575 "A" Ordinary shares of 2s. each. These are the presently unissued and undesignated shares of the company which will be classified as "A" shares, and will rank *pari passu* with the existing "A" shares. Half of these will be offered to the shareholders of the company at par as soon as possible. The other half will be subscribed for at par by the Colonial Development Corporation, who have also undertaken to subscribe at par for any shares not taken up by the shareholders. The remaining sum of £472,742 10s. will be advanced on a 6 per cent Debenture by the Colonial Development Corporation.

DEVELOPMENT STAGES

We regard the new dredge on the Lower Potaro as the first stage of our development. The Konawaruk is the second. We hope for a third stage in due course, which could well be the Upper Potaro. Obviously we cannot complete or finance our plans until the new prospecting programme has given us the necessary data.

The construction at Tumatumari is complete except for the bucket line, which is only a few days' job, and the main transformer. The disappointment occasioned by the delay on the Potaro River is to some extent offset by encouraging news from the Mahdia. Shareholders will remember that it was anticipated that the Mahdia River would be worked out by this time, so there was a danger of an unproductive gap between the exhaustion of the Mahdia area and production from the new dredge on the Lower Potaro. This has been avoided through the experience and initiative of Mr. Park, who found that we had a false bottom in the Upper Mahdia area.

The results for the year to date are encouraging. The figures for the Mahdia Dredge for the six months to January 31, 1951, are as follows: Yardage dredged, 395,773; fine ounces recovered, 3,704; grains of fine gold per cu. yd., 4.5.

The report was adopted, and at an Extraordinary General Meeting resolutions were passed confirming the agreement with the Colonial Development Corporation and approving the new share issue.

INVESTIGATIONS & MANAGEMENT LTD., Technical Consultants to

THE NANWA GOLD MINES LTD. SILVERMINES LEAD & ZINC CO., LTD.

and other mining companies, are continually requiring mining staff of all grades. Apply to Secretary, Finsbury House, Blomfield Street, London, E.C.2, giving record of service, references, etc.

SOUTH AFRICAN TOWNSHIPS MINING AND FINANCE CORPORATION LIMITED

(Incorporated in the Union of South Africa)

DECLARATION OF DIVIDEND NO. 43

NOTICE IS HEREBY GIVEN that Dividend No. 43 of 5 per cent, equal to 6d. per share, has been declared for the year ended December 31, 1950, payable to shareholders registered in the books of the Corporation at the close of business on March 9, 1951, and to persons presenting Coupon No. 43 from Share Warrants to Bearer.

The dividend is declared in the currency of the Union of South Africa and becomes due on March 10, 1951. Warrants will be posted from the Head and London Offices on or about April 10, 1951.

The dividend is payable subject to the usual conditions, which can be inspected at the Head and London Offices of the Corporation.

The Transfer Books and Register of Members will be closed from March 10, 1951 to March 16, 1951, both days inclusive.

Holders of Share Warrants to Bearer are notified that the dividend is payable at the Standard Bank of South Africa Ltd., 10, Clements Lane, Lombard Street, London, E.C.4, or at the Banque de l'Union Parisienne, 6 & 8, Boulevard Haussmann, Paris, on or about April 11, 1951. Coupons must be left four clear days for examination.

The effective rate of Non-Resident Shareholders' Tax is 7½ per cent.

The estimated profit for the year, after providing for taxation is £143,000 (last year £136,000).

By Order of the Board,

For and on behalf of

ANGLO AMERICAN CORPORATION OF SOUTH AFRICA
LIMITED

London Secretaries,
W. C. Squire.

London Office:

11, Old Jewry, E.C.2.

February 24, 1951.

MINE SURVEYOR urgently required for service on Gold Mine in Gold Coast Colony. Must be suitably qualified and conversant with underground mining. Salary £750 to £825 per annum plus £96 per annum cost of living allowance, contract for 15 months, 3 months on full salary subject to renewal. Apply with details past experience, reference, etc. to Secretary, Investigations & Management, Ltd., Finsbury House, Blomfield Street, London, E.C.2, or telephone: London Wall 1076 for appointment.

THE COLONIAL DEVELOPMENT CORPORATION have the following vacancies on the staff of a gold dredging property in British Guiana. Appointments are pensionable and furnished quarters are provided at a nominal rent. Marriage and outfit allowances payable in addition to the salaries quoted below.

1. **MINE SURVEYOR**.—University degree, A.R.I.C.S., A.R.S.M., or similar qualifications are desirable. Candidates should be experienced mine surveyors. Starting salary within the range of £950 to £1,350 including overseas allowances.
2. **REDUCTION OFFICER**.—University degree in metallurgy, A.R.S.M., or similar qualifications desirable. Must be fully experienced in the concentration and clean up of gold by gravity methods and amalgamation, retorting and bullion melting. Starting salary within the range of £850 to £1,150 including overseas allowances.
3. **ELECTRICAL ENGINEER**.—University degree in electrical engineering or similar qualifications desirable. Should be experienced in the operation and maintenance of diesel electric and hydro-electric power plant, transmission lines and dredge machinery. Starting salary within the range of £750 to £1,050 including overseas allowances.

Write giving full particulars: Personnel, 19, Curzon Street, London, W.1, quoting Serial No. 66, by March 22, 1951.

Metal and Mineral Trades

THE BRITISH METAL CORPORATION LIMITED

HEAD OFFICE
PRINCES HOUSE, 93 GRESHAM STREET, LONDON, E.C.2
Tel. Monarch 8055

AND AT
17 SUMMER ROW, BIRMINGHAM
Tel. Central 6441
47 WIND STREET, SWANSEA
Tel. Swansea 3166

OVERSEAS ASSOCIATES

THE BRITISH METAL CORPORATION
(AUSTRALIA) PTY., LIMITED,
SYDNEY, PERTH AND MELBOURNE

THE BRITISH METAL CORPORATION
(CANADA) LIMITED,
MONTREAL

DREW, BROWN LIMITED,
MONTREAL

THE BRITISH METAL CORPORATION
(INDIA) LIMITED,
CALCUTTA AND BOMBAY

THE BRITISH METAL CORPORATION
(SOUTH AFRICA) (PROPRIETARY) LTD.,
JOHANNESBURG

C. TENNANT, SONS AND CO.,
OF NEW YORK,
NEW YORK

THE COMMERCIAL METAL COMPANY LTD

66, GRESHAM STREET, LONDON, E.C.2

ORES, METALS (Ferrous and Non-Ferrous), METAL ALLOYS, METAL SEMI-PRODUCTS, CHEMICALS, PHARMACEUTICALS, and ALLIED RAW MATERIALS

Telephone: MONARCH 0211 (8 lines)

(Members of the London Metal Exchange)

Telegrams: COMETALCO LONDON

For Optimum Hardness and Strength

NITRIDED NITRALLOY STEEL

Particulars from:

NITRALLOY LIMITED

25 TAPTONVILLE ROAD, SHEFFIELD, 10

Telephone: 60689 Sheffield

Telegrams: Nitralloy, Sheffield

EASTERN SMELTING CO. LTD.

CAPITAL—AUTHORISED £500,000; £435,000 ISSUED.

Head Office: PRINCES HOUSE, 95 GRESHAM STREET, LONDON, E.C.2

Telephone: MONarch 7661/3

Telegrams: TIMAMASA, PHONE LONDON

TIN SMELTERS

BRANCHES THROUGHOUT THE MALAY STATES.

Sole Selling Agents: VIVIAN, YOUNGER & BOND, LIMITED - - 8 Basinghall Street, LONDON, E.C.2

Telephone: MONarch 7221/7

THE BRITISH TIN SMELTING COMPANY LIMITED

English Refined Tin

"HAWTHORNE" Brand

General Agents

W. E. MOULSDALE & CO., LTD.

2 CHANTREY HOUSE, ECCLESTON STREET, LONDON, S.W.1

THE STRAITS TRADING Co. Ltd. SINGAPORE

Straits Refined Tin

Straits Trading Co. Ltd." BRAND

Correspondents in U.K.

W. E. MOULSDALE & CO., LTD.

CHANTREY HOUSE, ECCLESTON STREET, LONDON, S.W.1

EVERITT & CO. LD.

40 CHAPEL STREET
LIVERPOOL

Tele. Address: Persistent, Liverpool

Phone: 2905 Central

SPECIALITY

MANGANESE PEROXIDE ORES,

We are buyers of:—
**WOLFRAM, SCHEELITE, MOLYBDENITE,
VANADIUM, ILMENITE, RUTILE,
ZIRCONIUM and TANTALITE ORES**

Suppliers of:—

FERRO-ALLOYS & METALS NON-FERROUS ALLOYS

GEORGE T. HOLLOWAY & CO. LTD.

**METALLURGISTS & ASSAYERS,
ORE TESTING, WORKS AND
METALLURGICAL RESEARCH LABORATORIES**
Atlas Road, Victoria Road, Acton,
LONDON, N.W.10

Telephone No.:
ELGAR 5202

Tels. & Cables:
NEOLITHIC LONDON

Phone: MANsion House 0327-8

Grams: Opencast, London

HENRY ROGERS SONS & CO.

Members of the London Metal Exchange

PLANTATION HOUSE, ROOD LANE, E.C.3.

METAL MERCHANTS AND BROKERS

Agents for BANKA TIN SALES OFFICE

ELTON, LEVY & CO. LTD. METALS

ORES — TAILINGS — DUMPS — RESIDUES — SCRAP
1/4, ST. ERMIN'S (WEST SIDE), CAXTON STREET,
LONDON, S.W.1

Telephone No. Whi 9621/2/3 Telegrams: Eppenleco, Sowest, London

Telephone:
LONDON Wall 7128/9

Cables:
UNIMETORE, LONDON

UNITED METALS, ORE & CHEMICALS LIMITED

Exporters & Importers

**ALUMINIUM, NON-FERROUS METALS
FERRO ALLOYS, SEMI-FINISHED PRODUCTS
SCRAP • RESIDUES • ORES**

61, BROAD STREET AVENUE, BLOMFIELD STREET
LONDON, E.C.2.

LEONARD COHEN LTD. 1 HAY HILL, LONDON, W.1

**GOLD, SILVER and the PLATINUM METALS
ORES, CONCENTRATES and RESIDUES
METAL HARDENERS and NON FERROUS
ALLOYS**

Telephone:
GROSVENOR 6284

Works:
PORTH, GLAM.

Telegrams:
CUPRIFUM, LONDON

New York Representatives

EUROPEAN METAL CORPORATION, 424 Madison Avenue, New York 17

ROURA & FORGAS, LTD.

Telephone Nos:
HOLBORN 0517-9

Sole Sterling Area Suppliers of

ITALIAN QUICKSILVER

HANOVER HOUSE,

73-78, HIGH HOLBORN, LONDON, W.C.1

International Smelters and Buyers of

SCRAP METALS AND RESIDUES

• SLAG
• SKIMMINGS
• DROSSES
• SWEEPINGS
• ASHES
• BY-PRODUCTS

INTERNATIONAL SMELTERS LTD

Christchurch Road, London, S.W.19

Phone: Mitcham 2181

Wire: Infasmelta, Phone, London.

WOLFRAM ORE TIN ORE

FELIX KRAMARSKY CORPORATION
39 BROADWAY
NEW YORK 6, N. Y.

Telephone :
Whitehall 3-4062

Cable Address :
Orewolfram

ENTORES, LIMITED

15-18 LIME STREET, LONDON, E.C.3

NON-FERROUS METALS ORES RESIDUES

Telegrams :
Entores, Phone, London

Telephone :
MANsion House 7914

— LEAD —

H. J. ENTHOVEN & SONS, LTD.

Smelters and Refiners

- **ANTIMONIAL LEAD**
for the Battery Trade
- **LEAD ALLOYS**
for the Cable Trade
- **PRINTING METALS** ● **SOLDERS**

City Office: 89 Upper Thames St., London, E.C.4.
Telephone: Mansion House 4533. Telegrams: Enthoven, Phone, London
Works: Rotherhithe, Croydon & Derbyshire

ROKKER & STANTON LTD.

DRAYTON HOUSE, GORDON STREET
LONDON, W.C.1

*Metal Stockists & Shippers
for*

**BRASS, COPPER, ALUMINIUM
AND NICKEL SILVER**
in

Sheets, Rods, Tubes, Strip, Wire, etc.

*Associated Companies in Holland and Belgium;
also Regd. in South Africa and Rhodesia.*

Tel: EUS 4751/2. Cables: BENTLY 2nd; A.B.C.6
Grams: ROKKER, WESTCENT, LONDON

ZINC SHAVINGS GRANULATED & POWDERED NON-FERROUS METALS

"Lead Wool" for Pipe-jointing.
Metallic Packing for Pumps, etc.

THE LEAD WOOL CO. LTD. SNODLAND KENT

Telephone: Snodland 84216 & 7. Telegrams: "Strength, Phone, Snodland"

H. BARNETT LTD.

VICTOR ROAD, LONDON, N.7.

IMPORT : EXPORT

Phone: ARCHWAY 5461 (5 lines) Established 1865

**WE SPECIALISE IN ALL NON-FERROUS
SCRAP AND INGOT METALS**

MINING & CHEMICAL PRODUCTS, LTD.

MANFIELD HOUSE, 376, STRAND, W.C.2

Telephone: Temple Bar 4511/3

Telegrams: "MINCHEPRO, LONDON"

Works: ALPERTON

WEMBLEY, MIDDLESEX

Buyers of silver ores and concentrates

Smelters and Refiners of

BISMUTH ORES, RESIDUES & METAL

Nickel and chrome plating

Refined and Commercial

**ARSENIC, CADMIUM, INDIUM,
SELENIUM, CAESIUM SALTS, TELLURIUM, THALLIUM**

Manufacturers of

**FUSIBLE ALLOYS SOLDER WHITE METALS
ANODES OF TIN, CADMIUM and ZINC**

Telephone : AMHERST 2211 (six lines)

E. AUSTIN & SONS

(London) LIMITED

ATLAS WHARF
Hackney Wick, London, E.9

Are Buyers of

**NON-FERROUS METALS
SCRAP BRASS · GUNMETAL
COPPER · ALUMINIUM**

Manufacturers of

**INGOT LEAD · TYPE METAL
ZINC, Etc.**

E. M. JACOB & CO. LTD.

Importers and Exporters of:
ORES • MINERALS • RESIDUES • SCRAP METALS

79 Bishopsgate, London, E.C.2

Telephone: LONdon Wai 9241

Cables: JACOMETA, LONDON

PLATT METALS LTD.

METAL MANUFACTURERS and MERCHANTS

BUYERS BRASS ROD SWarf AND SCRAP, and
 OF all descriptions of NON-FERROUS SCRAP
 METALS, BORINGS and RESIDUES.

SELLERS BILLETS AND INGOTS TO ANY REQUIRED
 OF COMPOSITION
 GRADED NON-FERROUS SCRAP METALS

**METALEX WORKS, Great Cambridge Road
 ENFIELD, Mddx.**

Telephone: ENField 3428 (8 lines)

Telegrams: Walton, Enfield

MAYBANK METALS LTD.

This new Company backed with the vast experience
 gained in a 101 YEARS of progressive trading, will
 expedite all orders.

**THE BUYING OF MIXED OR SORTED NON-FERROUS
 SCRAP METALS** and Supplying of Finely Graded Non-
 ferrous Scrap to Your Requirements.

MAYBANK METALS LTD.

STAR WORKS SPURGEON STREET, SOUTH WARK
 LONDON, S.E.1

Telephone: HOP 2432/3
 HOP 4212/3/4

HENEAGE METALS

for Quality Ingots

IN BRASS, GUN METAL
 & PHOSPHOR BRONZE.

PHONE ASTON CROSS 1177/8

HENEAGE METALS LTD. HENEAGE ST. BIRMINGHAM

CONSULTING METALLURGISTS

A.I.D. & A.R.B. Approved for
 MECHANICAL TESTING
 METALLURGICAL ANALYSIS

ACLOQUE & Co.

26 Bloomsbury Way, London, W.C.1 HOLborn 4487

Established 1912

Cables: "Hostombe"

Buyers of

CHROME ORE

R. HOSTOMBE LTD.

2, REGENT STREET • SHEFFIELD • ENGLAND

DEERING PRODUCTS LTD.

8 GREAT SMITH STREET, LONDON, S.W.1

**ORES • MINERALS • REFRACTORY
 RAW MATERIALS**

Telephone: ABBEY 2681/2

Cables: PRODEERING, LONDON

**ALL GRADES OF
 NON-FERROUS
 METAL SCRAP and
 METALLIC RESIDUES**

MANGANESE
 CHROME
 TUNGSTEN
 ANTIMONY
 TANTALITE
 ZIRCON RUTILE
 COLUMBITE

**ORES
 METALS
 FERRO-ALLOYS**

Philipp Brothers, Inc.

70 PINE STREET • NEW YORK 5, N. Y.

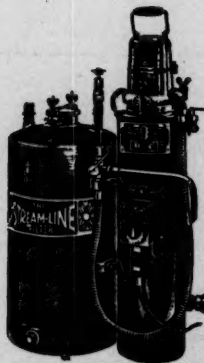
PHILIPP BROTHERS (Canada) LTD., MONTREAL, QUE.



OVER 35 YEARS OF SERVICE TO
 THE MINING INDUSTRY IN THE
 MARKETING OF ORES AND
 METALS

PHIBRO,
 New York

"I SAVE POUNDS A YEAR..."
says the Transport Manager

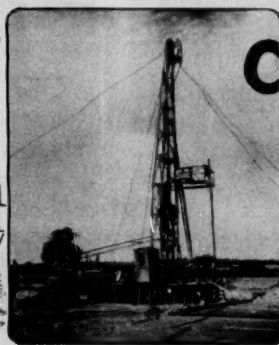


"With Stream-Line Filters, lubricating oil for my vehicles can be used over and over again. The result: lower charges for maintenance; longer periods between overhauls." 30,000 other users have also proved it!



STREAM-LINE FILTERS LTD

INGATE PLACE
 LONDON S.W.8
 TELEPHONE
 MACAULAY 1011



CORE DRILLING FOR COAL PROSPECTING

Illustrated is our Portable Mineral Drilling Unit part of the modern equipment we have available for your every need, together with highly skilled personnel and 100 years experience.

JOHN THOM Ltd
 CANAL WORKS PATRICROFT MANCHESTER

Telephone: ECCLES 2261/2

Telegram: THOM, PATRICROFT

**J.&P. INTRODUCE
 SEAMLESS**

**ALUMINIUM
 SHEATHED
 POWER CABLES**

*... a turning point
 in Cable Engineering*

Employing a revolutionary technique developed by their Research Staff, J. & P. are now producing power cables sheathed with a seamless tube of aluminium.

The superior qualifications of aluminium as a sheathing material have long been realized by cable engineers. Immense saving in weight, far higher tensile strength, greater creep resistance and fatigue endurance; these are but the more obvious advantages.

The implications of such a development are too great to be discussed in this limited space, and Engineers are therefore requested to ask for Publication CD 22 giving full details of tests, performances, installation and jointing.

JOHNSON & PHILLIPS LTD.,
CHARLTON, LONDON, S.E.7

Telephone: Greenwich 3244

